MINISTRY OF HEALTH

Blindness in England

1951-1954

REPORT BY
ARNOLD SORSBY

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1956

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INTRODUCTION

This is the third review by Professor Sorsby of the data contained in the blind registration certificates obtained from certain local authorities in England. It covers the period 1951–54 and supplements the data given each year in my annual report. In addition it reviews the period as a whole.

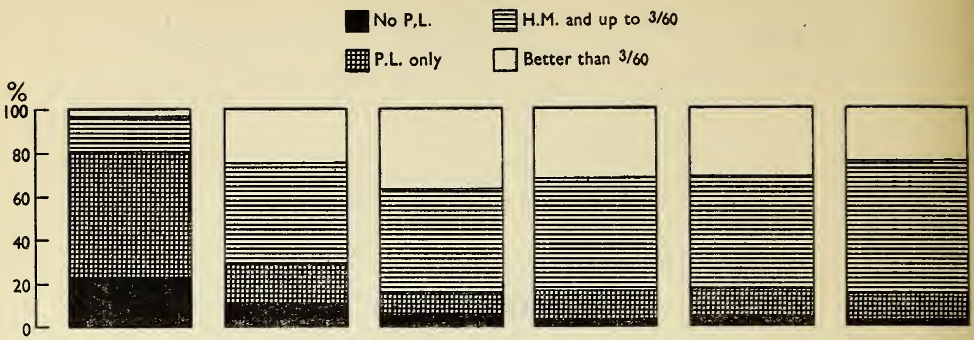
During this period it is the population aged over 70 years that has been mainly responsible for the rising rates of blindness. An analysis of the causes of blindness aiming at remedial measures must, therefore, take into account the additional geriatric problem. Social considerations also come into play as is seen from the fact that many of the newly registered blind are referred by the National Assistance Board.

Nevertheless, in the present report, particular attention is paid to the blind under 50 years of age. Though numerically not a very significant group, these blind present special problems. They become afflicted during the active years of life, and they present a complex of medical, occupational, social and genetic factors.

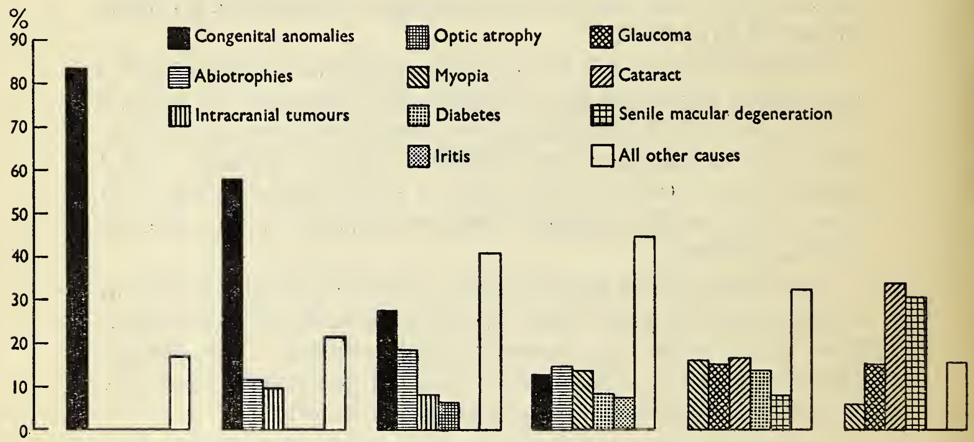
It would seem that the immediate future holds the prospect of an increasing number of registrations if only because of the increasing number of aged in the general population. That there are also other possibilities is suggested by the discussion on the causes of blindness and on the feasible immediate and long term measures.

JOHN A. CHARLES.
Chief Medical Officer,
Ministry of Health.

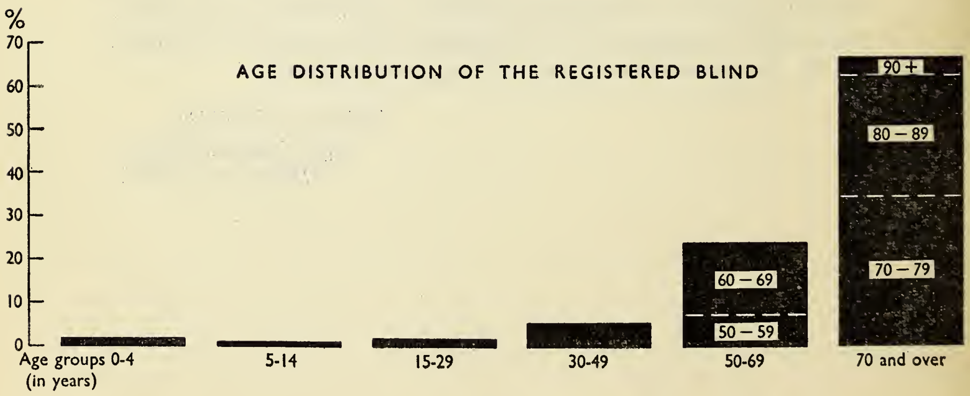
DEGREE OF BLINDNESS IN THE DIFFERENT AGE GROUPS



THE MAJOR CAUSES OF BLINDNESS IN THE DIFFERENT AGE GROUPS



AGE DISTRIBUTION OF THE REGISTERED BLIND



Diagrams showing the Distribution, the Causes and the Degree of Blindness over the different Age Groups

BLINDNESS IN ENGLAND, 1951-54

BY

ARNOLD SORSBY, M.D., F.R.C.S.

MATERIAL

BRIEF ACCOUNTS of the blind statistics for England and Wales and of the causes of blindness recorded in the certificates held by most of the local authorities of England have been given for the years 1951 to 1954 in the Annual Reports of the Chief Medical Officer of the Ministry of Health for 1952, 1953 and 1954. The present study gives more detailed information for each of these years and reviews the four-yearly period as a whole.

During April, 1951, to December, 1954, a total of 43,863 new registrations as blind were effected in England and Wales. The certificates issued by the local authorities served by the Southern and the Northern Regional Associations for the Blind were submitted for analysis—a total of 37,617 issued during the calendar years 1951–54. Of this total, 4,238 were excluded as either incomplete or inadequate; the remainder were analysed in the same manner and with the same limitations as in the study on 1948–50 (Sorsby, 1953). No certificates for Wales or for the West Country were available for analysis.

THE NUMBER OF BLIND

EACH OF THE FOUR years 1951 to 1954 showed an increase in both the blind population and the new registrations.

The number of blind rose sharply from 86,389 at March 31st, 1952, to 93,622 at December 31st, 1954, so that in less than three years there was an increase of over 7,000 (Table 1). Practically the whole of this increase is confined to the age group of 70 years and over, the other changes being mainly some increase in the age groups 1–4 years and 5–15 years, and some decrease in the age groups 21 to 39 years. As for the new registrations (Table 2), there were 11,459 for the year ending March 31st, 1952; registrations of the same order were recorded for the rest of 1952 and for 1953, but there was an increase of over a thousand for 1954. The increase is confined almost entirely to the highest age group, those aged 70 years or more; with this exception there was little movement in the new registrations over the period as a whole, the most significant being some decrease in the number registered at 0–1 year and also at 40–59 years.

Two considerations emerge:—

(1) By 1954 those aged 70 years and over constituted as much as 52·2 per cent of the registered blind population, and 68·9 per cent of the new registrations.

(2) There is an excess of women in the higher age groups, both in the blind population and amongst new registrations, and an excess of males in the lower age groups. The first excess is marked; the second is not.

TABLE 1

Registered Blind Population in England and Wales 1951–54: *by age and sex*

Age group (in years)	*0–1*	*1–4*	*5–15*	*16–20*	*21–30*	*31–39*	*40–49*	*50–59*	*60–64*	*65–69*	*70 and over*	*Not known*	*Total*
At March 31st 1952(1)													
Males	20	267	803	527	1,708	2,479	3,812	5,664	3,548	4,170	15,770	15	38,783
Females	20	220	639	386	1,177	1,776	3,098	5,306	3,803	5,053	26,104	24	47,606
Persons	40	487	1,442	913	2,885	4,255	6,910	10,970	7,351	9,233	41,874	39	86,389
At December 31st 1952(1)													
Males	9	275	844	521	1,665	2,446	3,808	5,646	3,606	4,250	16,422	17	39,509
Females	17	240	659	393	1,157	1,727	3,118	5,226	3,839	5,150	27,541	20	49,087
Persons	26	515	1,503	941	2,822	4,173	6,926	10,872	7,445	9,400	43,963	37	88,596
At December 31st 1953													
Males	16	298	873	518	1,608	2,403	3,836	5,547	3,603	4,271	17,003	8	39,984
Females	5	268	666	373	1,090	1,723	3,121	5,201	3,924	5,437	28,799	15	50,622
Persons	21	566	1,539	891	2,698	4,126	6,957	10,748	7,527	9,708	45,802	23	90,606
At December 31st, 1954													
Males	9	326	907	523	1,568	2,349	3,835	5,521	3,597	4,180	17,803	8	40,626
Females	8	267	705	366	1,046	1,688	3,097	5,228	4,013	5,482	31,083	13	52,996
Persons	17	593	1,612	889	2,614	4,037	6,932	10,749	7,610	9,662	48,886	21	93,622

(1) In 1952 the procedure of having returns made at March 31st for the previous 12 months was changed to returns being made at December 31st for the calendar year. Hence two returns were given during that year, the first one being essentially for 1951.

TABLE 2

New registrations in England and Wales by age and sex, 1951–54

Age group (in years)	*0–1*	*1–4*	*5–15*	*16–20*	*21–30*	*31–39*	*40–49*	*50–59*	*60–64*	*65–69*	*70 and over*	*Not known*	*Total*
1951*													
Males	41	87	89	38	98	126	208	394	344	479	2,633	3	4,540
Females	33	77	73	26	54	96	209	505	424	754	4,662	6	6,919
Persons	74	164	162	64	152	222	417	899	768	1,233	7,295	9	11,459
1952†													
Males	18	52	65	29	62	87	149	296	262	354	2,001	—	3,375
Females	24	50	42	16	50	54	136	333	316	564	3,395	2	4,982
Persons	42	102	107	45	112	141	285	629	578	918	5,396	2	8,357
1953													
Males	31	81	90	37	68	118	203	372	309	463	2,774	1	4,547
Females	24	66	50	29	49	94	197	466	444	801	4,780	3	7,003
Persons	55	147	140	66	117	212	400	838	753	1,264	7,554	4	11,550
1954													
Males	28	84	85	32	82	109	177	360	323	404	3,047	3	4,734
Females	23	69	54	21	53	86	186	462	456	787	5,563	3	7,763
Persons	51	153	139	53	135	195	363	822	779	1,191	8,610	6	12,497

* Returns for the year ending March 31st 1952.

† Returns at December 31st 1952; registrations over the nine months April—December 1952.

ANALYSIS OF BLIND CERTIFICATES

A TOTAL OF 33,379 blind certificates were available for analysis. The age distribution and the degree of blindness were studied for the group as a whole, whilst separate and more detailed analyses were made for those blinded by the same cause in both eyes and those blinded by a different cause in the two eyes.

AGE DISTRIBUTION AND DEGREE OF BLINDNESS

As the blind certificates analysed represent the bulk of the new registrations during the years in question, the age distribution revealed by these certificates (Table 3) follows closely that shown in the previous table for the newly registered blind. However, the data in Table 3 give greater detail on those aged 70 years and over, and it is seen that the age group 80–89 gives almost as high a proportion as that of 70–79 years, in spite of the fact that in the general population there are considerably fewer octogenarians than septuagenarians.

TABLE 3

Age at Registration for Blindness

(*with age distribution of general population*, 1951 *Census*)

Age (years)	*Blind Population*						*General Population*		
	Males		*Females*		*Persons*		*Males*	*Females*	*Persons*
	No.	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
0–1	112	0·9	88	0·3	200	0·6	1·6	1·5	1·5
1–4	209	1·6	180	0·9	389	1·2	7·5	6·6	7·0
5–14	204	1·6	137	0·7	341	1·0	14·5	12·9	13·6
15–19	115	0·9	76	0·3	191	0·6	6·4	6·0	6·2
20–29	235	1·8	155	0·8	390	1·2	14·5	13·8	14·2
30–39	328	2·6	284	1·4	612	1·9	15·0	14·3	14·6
40–49	567	4·5	545	2·7	1,112	3·4	15·3	14·7	15·0
50–59	1,033	8·2	1,304	6·9	2,338	7·1	11·4	12·4	11·9
60–69	2,111	16·7	3,377	16·7	5,490	16·7	8·2	9·9	9·1
70–79	4,297	34·0	6,969	34·6	11,272	34·4	4·6	6·1	5·4
80–89	3,158	25·0	6,092	30·2	9,260	28·2	1·0	1·7	1·4
90 and over ...	284	2·2	912	4·5	1,197	3·7	—	0·1	0·1
	12,653	100·0	20,119	100·0	32,792*	100·0	100·0	100·0	100·0
Not stated ...	250		332		587†				
	12,903		20,451		33,379				

* Including 20 persons sex not stated.

† Including 5 persons sex not stated.

Table 4 shows that total blindness (no perception of light) is exceptional amongst those registered as blind; almost total blindness (perception of light only) is more frequent, but well over half of those registered (55·8 per cent) have some degree of useful vision (hand movements and vision of up to 3/60 Snellen), whilst about a quarter have vision of more than 3/60. The number having vision better than 3/60 exceeds the combined number of those having no perception of light, or perception of light only. Taken as a whole the blind population is

TABLE 4

Degree of Blindness by Age Groups: percentage distribution

	Age group in years									*All known ages**	*All ages†*
	0–1	*1–4*	*5–14*	*15–19*	*20–29*	*30–39*	*40–49*	*50–69*	*70 and over*		
Number on which information is available ...	75	158	165	87	167	298	528	3,869	11,228	16,555	33,005
No perception of light...	29·3	20·3	10·3	4·6	6·6	3·0	4·4	4·3	3·4	4·0	4·6
Perception of light ...	61·4	56·3	18·8	6·9	11·4	12·8	11·9	12·3	12·2	12·9	13·4
Hand movements and up to 3/60 Snellen ...	8·0	19·0	45·4	43·7	49·1	54·7	50·4	52·7	59·4	56·5	55·8
Better than 3/60 Snellen	1·3	4·4	25·5	44·8	32·9	29·5	33·3	30·7	25·0	26·6	26·2
	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

* Data based on returns for 1953 and 1954.
† Data for 1951–54.

thus largely a population afflicted with grossly defective vision rather than with blindness in the restricted sense of the term.

Children and young adults differ from the rest of the blind population not merely in age but in the degree of blindness, for as can be seen from Table 4, more than 20 per cent of infants under the age of 5 years are recorded as totally blind. Admitting the difficulty of accurate assessment at these ages, a high incidence of total blindness—some 10 per cent—is also seen in blind children of school age. Furthermore the incidence of total blindness in the age group of 15–29 years is also higher than for the remaining age groups.

BLINDNESS FROM THE SAME CAUSE IN BOTH EYES

Causes of blindness

Of the total of certificates analysed, 30,795, or 92·3 per cent, showed blindness from the same cause in both eyes. Table 5, based on Table A in the appendix,

TABLE 5

Causes of Blindness responsible for more than 0·5 per cent. of specified causes

Cause	*Relative percentage of causes of Blindness*
	Persons (30,795)
Congenital anomalies	4·2
Abiotrophic defects	2·6
Myopia	8·5
Glaucoma	13·6
Cataract	26·2
" Primary " retinal detachment	0·7
Syphilis:	
Congenital	0·7
Acquired	0·3
All trauma	0·7
Vascular diseases	3·3
Diseases of central nervous system	0·5
Intracranial neoplasm	0·8
Diabetes	6·0
Senile macular lesions	21·6
Affections of the globe of indefinite aetiology ...	1·7
Corneal lesions of indefinite aetiology	1·6
Choroidal lesions of indefinite aetiology... ...	0·6
Iritis and iridocyclitis	2·5
Optic atrophy of unknown origin	2·0
All other causes	1·9
	100·0

gives the causes of blindness responsible for 0·5 per cent or more of cases with specified affections. It will be seen that some 76·7 per cent are concentrated in a few categories: cataract was responsible for 26·2 per cent, senile macular degeneration for 21·6 per cent, glaucoma for 13·6 per cent, myopia for 8·5 per cent, whilst the congenital anomalies and abiotrophic defects together contributed 6·8 per cent.

Other substantial causes of blindness were diabetes, which accounted for 6·0 per cent, the vascular diseases for 3·3 per cent, and iritis and iridocyclitis for 2·5 per cent, whilst optic atrophy of unknown origin was responsible for 2·0 per cent. The remaining 9·5 per cent were distributed over a large number of causes. It should be noted that infectious diseases as causes of blindness no longer figure substantially; the whole group accounts for only 1·9 per cent.

Prognosis and treatment

Generally speaking the question of prognosis and treatment only arises with the cataract cases. Table 6 shows that definitely irremediable cases are exceptional amongst those registered as blind from cataract; about one third are recorded as remediable, a further third as doubtful, and the remaining third as remediable by operation which, however, was not recommended because of the general condition. It would seem that some 50 per cent—and possibly more—of those registered as blind from cataract might well benefit from operation.

TABLE 6

Prognosis in cases of Cataract

State	*Males*		*Females*		*Persons*	
	No.	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*
Remediable...	974	38·3	1,856	33·7	2,831*	35·1
Not remediable	114	4·5	180	3·3	294	3·6
Doubtful	764	30·0	1,738	31·5	2,502	31·1
Remediable, but operation inadvisable on general grounds ...	692	27·2	1,733	31·5	2,429†	30·2
	2,544	100·0	5,507	100·0	8,056	100·0
Not known	5		2		7	
	2,549		5,509		8,063	

* Including 1 case sex not stated.

† Including 2 cases sex not stated.

The history of treatment in both cataract and glaucoma is recorded in Table 7. As much as 82·2 per cent of the cataract patients had had no surgical treatment; in contrast some 60 per cent of those registered as blind from glaucoma had undergone such treatment.

TABLE 7

Treatment in cases of Cataract and Glaucoma

Treatment	*Males*		*Females*		*Persons*	
	No.	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*
Cataract:						
None	1,999	78·6	4,614	83·8	6,618*	82·2
Incomplete	480	18·9	803	14·6	1,283	15·9
Complete	65	2·5	90	1·6	155	1·9
	2,544	100·0	5,507	100·0	8,056	100·0
Not known	5		2		7	
	2,549		5,509		8,063	
Glaucoma:						
None	625	35·7	778	31·9	1,404	33·5
Incomplete	126	7·2	170	7·0	296	7·1
Complete	998	57·1	1,487	61·1	2,487	59·4
	1,749	100·0	2,435	100·0	4,187	100·0
Not known	7		1		8	
	1,756		2,436		4,195	

* Including 5 cases sex not stated.

Age in relation to blindness

Causes of blindness at different ages

Table 8 gives the causes of blindness at the different ages.

In infants up to 5 years, over 83 per cent are caused by congenital anomalies, clearly environmental causes being exceptional; thus meningitis with 9 cases accounted for 1·6 per cent of all cases and ophthalmia neonatorum contributed one case. In children of school age (5–14 years), abiotrophic defects emerge as a significant cause accounting for 11·5 per cent of cases, the congenital anomalies still being the major cause with 57·6 per cent. In the subsequent age groups the relative significance of congenital defects declines with advancing age, whilst that of the abiotrophic defects rises to about 15–20 per cent in the age groups from 15 to 49 years. Increasing significance over the active years of life is also shown by myopia which rises from a proportionate incidence of 3·8 per cent at 15–19 years to 19·3 per cent at 50–59 years. Glaucoma is mainly operative in late middle life, whilst the incidence of cataract, as of senile macular degeneration increases steadily with advancing age. Congenital syphilis, whilst accounting for 3·0 to 4·5 per cent of cases in the age groups 20 to 49 years, contributes considerably less in the younger age groups; likewise ophthalmia neonatorum figures mainly in an older generation rather than in the children of today. Optic atrophy from intracranial neoplasm is a substantial cause at all age groups, whilst diabetes takes an increasing toll throughout the active years of life—as do iritis and iridocyclitis. Trauma, which in the statistics for all ages accounts for only 0·7 per cent of cases, figures prominently at 20 to 29 years with 5·9 per cent of all cases, and continues to contribute a substantial quota (though a smaller proportionate percentage) during the active years of life.

TABLE 8

Causes of blindness responsible for 2·5 per cent or more of cases in any age group
(Age at Registration)

	Percentage distribution of causes of blindness at age										
	0–4	*5–14*	*15–19*	*20–29*	*30–39*	*40–49*	*50–59*	*60–69*	*70–79*	*80–89*	*90 years and over*
Total number of cases in age group...	579	323	184	370	579	1,057	2,163	5,010	10,305	8,511	1,125
Congenital anomalies...	83·3	57·6	42·4	19·7	16·6	10·6	4·1	—	—	—	—
Abiotrophic defects	2·6	11·5	20·1	17·3	15·6	13·6	6·9	2·8	—	—	—
Myopia...	—	3·4	3·8	5·4	10·2	15·1	19·3	14·5	8·0	3·6	—
Glaucoma	—	—	—	—	—	5·1	11·4	16·3	17·8	12·4	7·3
Cataract	—	—	—	—	—	4·0	10·9	19·0	28·4	38·3	47·6
" Primary " retinal detachment ...	—	—	—	3·5	3·6	3·0	2·5	—	—	—	—
Intraocular tumour	3·1	—	—	—	—	—	—	—	—	—	—
Congenital syphilis	—	—	—	3·0	4·5	4·4	—	—	—	—	—
Tuberculosis	2·9	2·8	3·8	—	—	—	—	—	—	—	—
All trauma	—	—	—	5·9	2·8	—	—	—	—	—	—
Vascular diseases	—	—	—	—	—	2·7	3·6	4·7	4·1	—	—
Diseases of central nervous system ...	—	2·5	3·3	5·4	5·9	3·0	—	—	—	—	—
Intracranial neoplasm	—	9·3	6·5	8·4	5·5	3·8	—	—	—	—	—
Diabetes	—	—	—	6·8	7·3	8·3	12·2	13·8	5·8	—	—
Senile macular lesion	—	—	—	—	—	—	—	9·3	24·7	36·2	38·4
Optic atrophy of unknown origin ...	—	3·4	6·6	5·7	3·6	4·4	3·5	—	—	—	—
Iritis and iridocyclitis...	—	—	3·3	5·1	8·3	6·5	5·9	3·6	—	—	—
Corneal lesions of indefinite aetiology	—	—	—	—	—	2·8	3·0	—	—	—	—
Choroidal lesions of indefinite aetiology	—	—	—	—	—	2·8	—	—	—	—	—
Affections of the globe of indefinite aetiology	—	—	—	—	2·8	3·2	2·7	—	—	—	—
All other causes	8·1	9·5	10·2	13·8	13·3	6·7	14·0	16·0	11·2	9·5	6·7
	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

TABLE 9

Causes of blindness responsible for 1 per cent. or more of Cases: Percentage distribution over the different Age Groups (Age at Registration)

Cause	*Age at Registration*											*Total*	*Number on which information is available*
	0–4	*5–14*	*15–19*	*20–29*	*30–39*	*40–49*	*50–59*	*60–69*	*70–79*	*80–89*	*90 years and over*		
Congenital anomalies...	37·9	14·6	6·1	5·8	7·6	8·8	6·9	6·1	5·0	1·1	0·1	100·0	1,272
Abiotrophic defects ...	1·9	4·7	4·7	8·1	11·5	18·3	19·0	17·8	11·2	2·7	0·1	100·0	788
Myopia...	0·2	0·4	0·3	0·8	2·3	6·2	16·4	28·3	32·3	12·0	0·8	100·0	2,555
Glaucoma	—	—	—	0·1	0·3	1·3	6·0	19·9	44·7	25·7	2·0	100·0	4,112
Cataract	—	—	—	—	—	0·5	3·0	12·0	36·8	41·0	6·7	100·0	7,948
Syphilis:													
Congenital	—	1·3	1·3	5·0	11·7	21·2	15·8	24·3	15·8	3·6	—	100·0	222
Acquired	—	—	—	1·3	9·5	9·5	35·1	36·5	8·1	—	—	100·0	74
Vascular disease ...	—	—	—	0·3	0·4	3·0	7·8	24·0	42·6	20·6	1·3	100·0	983
Diabetes	—	—	0·1	1·4	2·3	4·8	14·4	37·9	32·6	6·4	0·1	100·0	1,821
Senile macular lesions	—	—	—	—	—	—	0·7	7·1	38·7	46·9	6·6	100·0	6,574
Optic atrophy of unknown origin ...	2·2	1·9	2·0	3·6	3·6	8·0	13·0	19·7	27·3	16·8	1·9	100·0	585
Iritis and iridocyclitis...	—	0·1	0·8	2·5	6·3	9·0	16·7	23·4	28·9	11·5	0·8	100·0	762
Corneal lesions of indefinite aetiology ...	0·6	0·2	0·4	1·1	1·7	6·2	13·5	21·8	36·1	17·6	0·8	100·0	482
Affections of globe of indefinite aetiology ...	0·2	0·8	0·6	1·8	3·2	6·9	11·9	23·0	32·3	17·9	1·4	100·0	496

Distribution of the major causes of blindness over the different age groups

Discounting the possibility that there may have been a long interval between the onset of blindness and of registration, it will be seen from Table 9 that an unexpectedly high proportion of cases of myopia, diabetes, and retinal detachment occur in the higher age groups.

Sex differences

There was a considerable female excess, there being 11,644 males against 19,131 females (in addition to 20 persons sex unknown). As this female excess (reflecting that seen for registrations as a whole) is confined to the higher age groups, the proportionate incidence of the different causes as between the two sexes becomes unbalanced (Tables A and A1).

A clearer appreciation of any possible sex difference is feasible from comparison of the proportionate distribution of causes in the different age groups (Table 10). This reveals that the significant sex differences are relatively few:—

(1) Congenital syphilis gives a higher proportionate incidence in females at all age groups.

(2) This is also largely true for iritis and iridocyclitis.

(3) There is a marked female excess for diabetes in the age groups over 50.

(4) In contrast there is a marked male excess for both vascular diseases and for optic atrophy in the age groups over 50.

(5) A marked sex difference is shown by trauma. At practically all ages the incidence of blindness from trauma is some 7 to 10 times heavier in men compared with women. Whilst the incidence is not very substantial in women at all ages, the incidence in men during the active years of life is considerable, being 6·9 per cent at 15 to 29 years and 4·2 per cent at 30 to 49 years. The highest disproportion was in the age group 20–29 years, in which 21 men were recorded as blind from all forms of trauma against 1 woman; the percentage for males at this age was 9·4.

There is nothing to suggest that there is any sex difference in the degree of blindness of those registered. Amongst those blind from cataract there was a higher incidence of women who had not sought operation (Table 7), as also a higher incidence of those whose cataract was not regarded as remediable (Table 6). This once more reflects the considerable proportion of aged amongst women registered as blind. In contrast glaucoma with its lower age incidence showed but little sex difference in the history of treatment obtained (Table 7).

TABLE 10

Causes of blindness responsible for 2·5 per cent or more of cases in certain age groups by sex

	Age Groups														
	0–14			*15–29*			*30–49*			*50–69*			*70 years and over*		
	M	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*
Total number of cases on which information is available	510	392	902	334	220	554	840	796	1,636	2,772	4,401	7,173	6,941	13,000	19,941
Congenital anomalies ...	72·5	76·0	74·0	26·3	28·6	27·3	12·3	13·2	12·7	2·8	2·0	2·3	—	—	—
Abiotrophic defects... ...	5·9	5·6	5·8	18·8	17·3	18·2	15·9	12·7	14·4	5·1	3·4	4·1	—	—	—
Myopia	1·2	2·5	1·7	5·1	4·5	4·9	12·1	14·6	13·3	14·2	17·0	15·9	4·4	6·5	5·8
Glaucoma	—	—	—	—	—	—	3·9	4·0	4·0	17·6	13·1	14·9	17·2	13·7	14·9
Cataract	—	—	—	—	—	—	2·4	2·8	2·6	15·4	17·2	16·5	29·7	35·8	33·7
Other primary defects ...	—	—	—	3·3	1·4	2·5	4·3	2·1	3·2	—	—	—	—	—	—
Intraocular tumour	2·5	2·0	2·3	—	—	—	—	—	—	—	—	—	—	—	—
Congenital syphilis	—	—	—	1·2	4·5	2·5	2·6	6·4	4·5	—	—	—	—	—	—
Tuberculosis...	2·9	2·8	2·9	—	—	—	—	—	—	—	—	—	—	—	—
All trauma	—	—	—	6·9	0·5	4·3	4·2	0·5	2·4	—	—	—	—	—	—
Vascular diseases	—	—	—	—	—	—	—	—	—	5·8	3·5	4·4	3·8	2·8	3·2
Diseases of central nervous system	—	—	—	4·5	5·0	4·7	4·8	3·3	4·0	—	—	—	—	—	—
Intracranial neoplasm ...	3·9	3·1	3·5	6·6	9·5	7·8	4·6	4·1	4·4	—	—	—	—	—	—
Diabetes	—	—	—	4·2	5·4	4·7	8·1	7·8	7·9	6·4	17·6	13·3	1·8	4·5	3·6
Senile macular lesions ...	—	—	—	—	—	—	—	—	—	8·2	6·6	7·2	33·9	28·5	30·4
Iritis and iridocyclitis ...	—	—	—	3·9	5·4	4·5	6·7	7·7	7·1	3·6	4·6	4·3	—	—	—
Optic atrophy of unknown origin	2·4	3·0	2·7	5·4	6·8	6·0	4·4	3·9	4·2	4·1	1·8	2·7	—	—	—
Corneal lesions of indefinite aetiology	—	—	—	—	—	—	2·1	2·5	2·3	2·0	2·6	2·4	—	—	—
Affections of globe of indefinite aetiology	—	—	—	—	—	—	2·9	3·3	3·1	3·0	2·1	2·4	—	—	—
All other causes	8·7	5·0	7·1	13·8	11·1	12·6	8·7	11·1	9·9	11·8	8·5	9·6	9·2	8·2	8·4
	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Annual variations

The significant aspects are shown in Table 11.

TABLE 11

The more significant annual variations in the registrations 1951–54

		1951	1952	1953	1954
(*a*) *Degree of Blindness:*					
Percentage of those registered with central visual acuity of more than 3/60 Snellen		25·9	26·0	25·7	27·4
(*b*) *Causes of Blindness:*					
(Total number blinded by the same cause in both eyes)		(7,484)	(7,741)	(7,452)	(8,118)
(i) Proportionate percentage of the three major causes of blindness by sex:					
Cataract	M.	23·1	21·3	21·5	21·7
	F.	30·1	29·1	28·6	27·6
Senile macular degeneration	M.	20·0	22·0	22·9	24·9
	F.	18·1	21·2	21·6	23·3
Glaucoma...	M.	15·3	15·1	15·6	14·5
	F.	13·7	13·1	12·6	11·7
(ii) Number of individuals registered as blind from some affections which appear to be declining or increasing in significance:					
Congenital anomalies		371	340	280	308
Diabetes		367	448	464	582
Senile macular degeneration ...		1,409	1,668	1,645	1,939
(*c*) *Treatment:*					
(i) Percentage of those registered blind from cataract who have had no treatment		81·2	82·2	80·8	84·4
(ii) Percentage of those registered blind from glaucoma who have had full treatment		61·7	61·8	57·7	56·2

(i) *Degree of blindness.* During the period under review the standards of certification do not appear to have changed substantially. The percentage of those registered as blind, though central visual acuity was more than 3/60, was fairly even throughout these years (Table 11(*a*)).

(ii) *Age distribution.* As with new registrations as a whole, an increasing proportion of those aged 70 years or more was found each year in the certificates analysed.

(iii) *Cause of blindness.* The annual variations in the relative significance of some of the major causes of blindness are shown in Table 11(*b*). A steady increase year by year has occurred in the proportionate incidence of cases with senile macular degeneration—consistent with the increasing percentage of the aged amongst the newly registered.

The actual number of cases of blindness due to senile macular degeneration and to diabetes has risen over the four years, whilst the number recorded for congenital anomalies has decreased. Otherwise there was remarkably little variation in the numbers registered for the different causes over the different years.

(iv) *Treatment.* There is little to suggest that the incidence of untreated cataract amongst the registered blind is decreasing. It is, however, possible that in glaucoma there is some decrease in the proportion of treated cases that have ended in blindness (Table 11(*c*)).

BLINDNESS FROM A DIFFERENT CAUSE IN BOTH EYES

In all 2,584 persons showed a different cause of blindness in the two eyes, constituting 7·7 per cent of the total. In contrast to the major group the two sexes were fairly evenly represented, and there were fewer registered at the lower age groups. Table 12 gives the comparative figures.

TABLE 12

Comparison of age distribution by sex of those blinded by the same cause and by a different cause in the two eyes

	Blindness from the same cause in the two eyes			*Blindness from a different cause in the two eyes*		
	Percentage distribution					
	M	*F*	*P*	*M*	*F*	*P*
Number on which age and sex are known	11,422	18,822	30,244	1,231	1,297	2,528
Age groups in years:						
0–29	7·5	3·3	4·9	1·3	0·5	0·7
30–49	7·4	4·3	5·5	3·6	1·8	2·6
50–69	24·3	23·4	23·7	30·3	21·7	26·2
70 and over	60·8	69·0	65·9	64·8	76·0	70·5
	100·0	100·0	100·0	100·0	100·0	100·0

Causes of blindness

Table B in the appendix gives the causes of blindness in the 5,168 eyes, and these findings are summarised in Table 13. It will be seen that cataract, trauma, and glaucoma are the outstanding causes. For the group as a whole it may therefore be taken that the largest proportion had lost the sight of one eye from cataract, and that generally the sight of the other eye had been lost from trauma or glaucoma.

TABLE 13

Blindness from a different cause in the two eyes

Causes of blindness responsible for more than 0·5 *per cent of specified causes: each eye listed separately*

Cause	*Per cent.*
Number of eyes...	5,168
All trauma	19·9
Cataract...	23·7
Glaucoma	12·1
Senile macular lesions...	7·7
Affections of the globe of indefinite aetiology	6·6
Vascular diseases	7·4
Corneal lesions of indefinite aetiology	3·2
Myopia ...	4·2
Amblyopia ex anopsia...	4·0
" Primary " retinal detachment	3·4
Iritis and iridocyclitis ...	1·7
Optic atrophy ...	1·5
Congenital anomalies ...	0·8
All other causes	3·8
	100·0

Trauma was the one cause that showed a substantial sex difference in incidence (Table 14). It will be seen that there is some male proportionate excess from war trauma and a particularly marked excess (both proportionate and actual) for industrial trauma. Generally, injury was the cause of blindness in the first eye, so that it is not possible—on the hearsay evidence available—to give any valid data on the age incidence of industrial trauma. The causes and significance of sympathetic ophthalmia are discussed below.

TABLE 14

Percentage Distribution by sex of the different varieties of Trauma as a cause of unilateral blindness: each eye listed separately

	Males	*Females*	*Persons*
Number of eyes blinded by trauma...	664	365	1,029
Industrial trauma ...	9·5	1·1	5·2
Industrial disease ...	—	0·0	0·0
Non-industrial trauma	11·5	9·5	10·4
Non-industrial disease	0·2	0·0	0·1
Birth trauma...	—	—	—
War trauma ...	2·2	0·3	1·2
Trauma, not specified	1·0	0·6	0·8
Sympathetic ophthalmia	2·0	2·3	2·2
	26·4	13·8	19·9
All other causes	73·6	86·2	80·1
	100·0	100·0	100·0

Annual variations

In numbers, sex distribution, age distribution and causes of blindness, there were no substantial variations over the four years.

SOME DATA ON SYMPATHETIC OPHTHALMIA AND ON RETROLENTAL FIBROPLASIA

The certificates on cases of sympathetic ophthalmia and on retrolental fibroplasia were analysed in greater detail to bring out the significant clinical data they contain.

Sympathetic ophthalmia

It can be seen from Table 15 that:

(1) Operations for cataract and non-industrial injuries are the outstanding causes of sympathetic ophthalmia.

There is a female excess for sympathetic ophthalmia following cataract. This, however, is probably nothing more than a reflection of the excess of women undergoing cataract operation. In contrast there is a male excess for sympathetic ophthalmia following non-industrial injury. This is probably real, for the cases are drawn from a fairly even incidence of non-industrial injuries in the two sexes. This suggests that such injuries in men are often of a perforating character.

(2) Non-industrial accidents may possibly be more prone to give sympathetic ophthalmia than industrial injuries.

This is suggested by the fact that in men there were 8 cases of sympathetic ophthalmia in 240 industrial injuries against 18 cases in 290 non-industrial injuries.

(3) Glaucoma operations figure with 11 cases out of the total of 114—an unexpectedly high incidence.

(4) The total incidence of sympathetic ophthalmia is probably declining, for the 114 cases occurred in a total of 33,379 certificates analysed in the present study against 120 in 18,150 certificates in 1948–50.

TABLE 15

Sympathetic Ophthalmia—Causes by Year and Sex

	Year								*Total*		
	1951		*1952*		*1953*		*1954*				
	Males	*Females*	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*	*Persons*
Following:											
Cataract operation ...	6	7	7	5	4	15	3	17	20	44	65*
Glaucoma operation	—	—	2	1	—	4	1	3	3	8	11
Industrial trauma ...	4	1	2	—	2	—	—	—	8	1	9
Non-industrial trauma	6	3	4	2	6	2	2	1	18	8	26
War trauma	1	—	—	—	1	—	—	—	2	—	2
Other	—	—	—	—	—	1	—	—	—	1	1
	17	11	15	8	13	22	6	21	51	62	114*

* Including one case sex not stated in 1953.

Retrolental fibroplasia

All the certificates of infants under 5 years were analysed to assess the relative significance of retrolental fibroplasia and the major clinical affections recorded in this age group. Table 16 sets out the findings by sex in infants of up to 1 year and in those aged 1–4 years.

TABLE 16

Causes of blindness in infants 0–4 *years*

Age groups	0–1		1–4		*Total*	
	M	*F*	*M*	*F*	*M*	*F*
Congenital defects:						
Globe as a whole	23	23	68	37		
Lens	4	4	14	20		
Optic nerve	14	3	28	27		
Other specified defects ...	9	7	12	11		
	—— 50	—— 37	——122	—— 95	172	132
Retrolental fibroplasia	55	49	48	54	103	103
Optic atrophy (not specified as congenital)	3	1	25	21	28	22
Retinoblastoma	4	—	8	6	12	6
Ophthalmia neonatorum	—	—	—	1	—	1
Other	—	1	6	3	6	4
	112	88	209	180	321	268

It is seen that retrolental fibroplasia with 206 cases out of a total of 589 has emerged as the largest single cause of blindness, being responsible for more than half of the registrations in infants under 1 and rather more than 25 per cent at 1–4 years.

It is also seen that:

(1) Congenital defects—generally multiple defects affecting the globe as a whole—are the outstanding cause of blindness in the age group as a whole, and account for only slightly less than retrolental fibroplasia in those aged under 1 year.

(2) The outstanding environmental cause of blindness is optic atrophy occurring in infants over 1 year, due to a variety of causes including tuberculous meningitis. Ophthalmia neonatorum has ceased to contribute anything but the occasional case.

(3) Retinoblastoma—which in this context means the bilateral affection—is a not insignificant cause of blindness in infancy.

Babies blinded by retrolental fibroplasia are generally registered early. This is shown by Table 17 which sets out the ages at which registration was effected in retrolental fibroplasia in each year 1951–54 as against all the other affections as one group. It is seen that:

(1) in retrolental fibroplasia most registrations are carried out in the first year of life, each of the succeeding years showing progressively fewer cases;

(2) in contrast, all other cases—though predominantly congenital affections—tend to be registered more evenly throughout infancy;

TABLE 17

Age at registration of blindness from retrolental fibroplasia set against the ages recorded for all other causes at 0–4 years

Age at registration in years:	0–1		1–2		2–3		3–4		4–5		*Total*	
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*
Retrolental Fibroplasia:												
1951	18	13	5	7	2	3	1	—	—	—	26	23
1952	15	10	10	11	4	8	—	1	1	—	30	30
1953	15	13	9	3	2	6	3	1	2	—	31	23
1954	7	13	3	4	2	4	3	3	1	3	16	27
1951–54 ...	55	49	27	25	10	21	7	5	4	3	103	103
All other causes: 1951–54 ...	57	39	58	38	45	29	26	32	32	27	218	165

(3) there has been no marked change in the number registered during each of the four years 1951–54. The highest number for all ages up to 5 years was 60 in 1952 and the lowest 43 in 1954. The highest number registered under the age of 1 year was 31 in 1951 and the lowest 20 in 1954;

(4) in marked contrast to the congenital anomalies with their male excess, there is nothing to suggest any sex difference in the incidence of retrolental fibroplasia.

The cases registered were spread unevenly over the country. This is shown in Table 18, from which it is seen that making allowance for the uneven concentration of population, there were considerable regional fluctuations. Apart from a heavy incidence of cases in London and Lancashire, the most striking occurrences were:

(1) a high incidence in Oxfordshire, the N. Riding of Yorkshire, Lincolnshire, and Sussex;

(2) a low incidence in Derbyshire, Surrey, Staffordshire, Warwickshire and the W. Riding of Yorkshire.

The data for large towns emphasize these trends. In contrast to the high incidence in London, Liverpool and Manchester, cities like Birmingham, Sheffield and Leeds, and possibly also Bradford and Stoke-on-Trent, show an unexpectedly low incidence. It would almost seem as if there is a central inland area in the country with a low incidence.

TABLE 18

Geographical distribution of the 206 *cases of retrolental fibroplasia aged* 0–4 *years registered during* 1951–54

Number of cases in the different counties arranged in ascending order of population in 1953

Counties with a population of:	*No. recorded*	*Counties with a population of:*	*No. recorded*
Less than 250,000:		750,000–1,000,000:	
Rutland, Westmorland, Huntingdonshire, Isle of Ely, and Cambridgeshire	—	Northumberland	7
		Derbyshire	2
		Nottinghamshire	4
250,000–500,000:		Sussex	10
Cumberland	—		
Oxfordshire	4	1,000,000–1,500,000:	
Shropshire	—	Hampshire	6
Bedfordshire	2	Cheshire	6
Buckinghamshire	1	Durham	6
Berkshire	2	1,500,000–2,000,000:	
Northamptonshire and Soke of Peterborough	2	Kent	11
		Surrey	3
Suffolk	4	Staffordshire	2
500,000–750,000:		Warwickshire	5
Yorkshire, E. Riding	2	2,000,000–2,500,000:	
Yorkshire, N. Riding	6	Essex	9
Worcestershire	—	Middlesex	7
Norfolk	3		
Lincolnshire	7	>2,500,000:	
Leicestershire	3	London (Pop. 3,343,000)	34
Hertfordshire	—	Yorkshire, W. Riding (Pop. 3,574,000)	11
		Lancashire (Pop. 5,093,000)	47

Numbers recorded (and included in the above figures)

Towns given in descending order of population

In towns with a population in excess of 500,000	*No. recorded*	*In towns with a population between* 250,000 *and* 500,000	*No. recorded*
London	34	Nottingham	1
Birmingham	3	Hull	2
Liverpool	21	Newcastle-on-Tyne	3
Manchester	10	Bradford	—
Sheffield	1	Leicester	2
Leeds	2	Stoke-on-Trent	—
		Coventry	1

Note that Wales and the West Country were not covered by this analysis.

The annual fluctuations observed in the three most populous counties and in Birmingham—the largest city in the country—are shown in Table 19. The noteworthy features are:

(1) The virtual disappearance of the affection in Manchester since 1951.

(2) The persistence of high numbers for London, and to a lesser extent for Liverpool.

(3) The high incidence in Lancashire in 1951.

TABLE 19

Annual variations in registrations of retrolental fibroplasia in the three most populous counties and in Birmingham

	London	*Lancashire*		
		Liverpool	*Manchester*	*The rest of the county*
Population in 1953:	3,343,000	790,000	702,000	3,601,000
Year:				
1951	8	9	9	6
1952	13	5	—	2
1953	6	5	—	4
1954	7	2	1	4
	34	21	10	16

	Yorkshire: West Riding			*Birmingham*
	Sheffield	*Leeds*	*The rest of the county*	
Population in 1953:	508,000	505,000	2,561,000	1,118,000
Year:				
1951	—	1	3	—
1952	1	—	1	1
1953	—	1	2	1
1954	—	—	2	1
	1	2	8	3

DATA FROM SCHOOLS FOR THE BLIND AND SUNSHINE HOMES

DATA EXTRACTED from the records of admission of pupils to Schools for the Blind and of blind infants below school age to Sunshine Homes are of value because of the considerable clinical detail they contain, and because they allow comparative assessments over a number of years.

THE SCHOOLS FOR THE BLIND

The children at schools for the blind are essentially the same as in the age group 5–14 years recorded in the analysis of B.D.8 forms, except that the population in a school for the blind contains not only those registered at school age but also children who have been blind since infancy and were admitted to school at the age of 5 years; moreover, the school for the blind keeps children till the age of 16 years. The distribution of defects and causes seen in the records of 723 children aged 5 to 16 years at provincial schools for the blind in 1954 is shown in Table 20. The outstanding finding is the low incidence of causes other than congenital and hereditary defects.

The incidence of blindness produced by recognized transmitted maternal infections was as low as 0·6 per cent of the total, whilst acquired causes were responsible for 12·0 per cent, mainly contributed by three affections: secondary optic atrophy (5·1 per cent), injury and sympathetic ophthalmia (2·4 per cent) and ophthalmia neonatorum (1·9 per cent). Causes of indefinite character—where the cause of blindness could not be clearly established as either due to pre-natal influences or to acquired causes—accounted for 10·8 per cent, whilst in 1·5 per cent the records were inadequate. The bulk of the cases were frank congenital defects, which accounted for no less than 57·8 per cent of the total. Congenitally determined anomalies gave a further 14·5 per cent, and myopia contributed another 2·8 per cent. It may be noted that at schools for the blind —with their population aged 5 to 16 years—retrolental fibroplsaia accounted for only 7 cases in 1954.

THE SUNSHINE HOMES

The Sunshine Homes cater for infants under the age of 5 years. Data on the admissions for each of the eleven years 1944 to 1954 are shown in Table 21. For the four years 1951–54, the essential finding was the sudden emergence of retrolental fibroplasia as the outstanding cause of blindness in infants—137 of the 281 admissions during these years being due to this one cause.

In other respects the findings are similar to those recorded for schools for the blind. Environmental causes of blindness have virtually disappeared. Cases of indeterminate aetiology are few, and the bulk of cases are frankly congenital defects.

TABLE 20

Causes of blindness in children aged 5–16 years at 13 provincial Schools for the Blind, 1954

	Birmingham Royal Institute of the Blind		*East Anglian School for Blind and Deaf Children*		*Glamorgan Institute for the Blind*		*Royal London Society for Teaching and Training the Blind, Dorton and Drayton*		*Royal National Institute for the Blind, Condover Hall School*		*Royal National Institute for the Blind*		*Royal School for the Blind, Bristol*		*Royal Victoria School for the Blind, Newcastle*		*St. Vincents School for the Blind, Liverpool*		*School for Blind Children, Wavertree, Liverpool*		*Sheffield School for Blind Children*		*Yorkshire School for the Blind*		*Total*		
											Worcester College	*Chorleywood College*															
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*P*
Pre-natal influences (other than maternal infections):																											
Cataract	9	8	3	2	2	3	11	8	8	7	1	2	9	8	2	1	4	5	5	7	6	7	5	2	65	60	125
Retinitis pigmentosa and allied conditions...	6	6	1	1	4	1	11	11	2	3	1	7	7	1	—	1	1	1	2	2	3	—	4	1	42	35	77
Buphthalmos	7	5	1	—	5	2	4	6	3	—	3	3	7	1	1	1	1	2	5	—	5	—	2	—	44	20	64
Glioma	5	3	—	1	1	1	1	7	—	—	1	4	4	5	2	1	2	1	1	3	—	2	—	—	17	28	45
Nystagmus	5	5	2	2	5	4	—	—	3	2	3	—	—	—	3	—	2	—	—	—	1	1	1	2	25	16	41
Microphthalmos	4	3	—	—	1	1	—	3	2	2	2	1	—	—	—	—	2	1	3	—	1	4	—	—	15	15	30
Optic Atrophy:																											
Congenital optic atrophy	5	1	—	1	—	—	1	—	—	6	—	1	—	—	1	3	—	3	—	—	2	—	—	—	9	15	24
Hereditary optic atrophy	1	—	1	—	—	—	6	—	—	—	—	—	2	—	—	—	—	—	1	—	1	—	—	—	12	—	12
Leber's disease	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	2	—	2
High Myopia	1	—	6	1	1	—	4	2	—	2	1	—	1	—	—	—	—	—	—	—	—	1	—	—	14	6	20
Albinism...	3	4	1	1	1	—	1	1	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	8	6	14
Detached retina...	1	—	—	1	—	—	1	1	1	1	1	—	1	—	—	—	1	—	—	—	1	1	2	—	9	4	13
Coloboma	—	1	—	1	—	1	—	1	—	1	—	1	3	1	—	—	—	—	2	—	—	—	—	—	5	7	12
Aniridia	1	2	1	—	—	—	—	—	—	2	—	—	—	—	—	2	—	—	—	2	—	1	—	—	2	9	11
Retrolental fibroplasia	1	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	2	5	7
Corneal lesions:																											
Corneal dystrophy	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Congenital corneal lesions	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	1	2
Subluxation of lens	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
Other congenital affections	3	2	1	2	—	1	1	2	1	—	3	—	3	2	—	—	1	—	1	1	2	—	10	5	26	15	41

TABLE 20—*contd.*

Causes of blindness in children aged 5–16 *years at* 13 *provincial Schools for the Blind,* 1954

	Birmingham Royal Institute of the Blind		*East Anglian School for Blind and Deaf Children*		*Glamorgan Institute for the Blind*		*Royal London Society for Teaching and Training the Blind, Dorton and Drayton*		*Royal National Institute for the Blind, Condover Hall School*		*Royal National Institute for the Blind*		*Royal School for the Blind, Bristol*		*Royal Victoria School for the Blind, Newcastle*		*St. Vincents School for the Blind, Liverpool*		*School for Blind Children, Wavertree, Liverpool*		*Sheffield School for Blind Children*		*Yorkshire School for the Blind*		*Total*		
											Worcester College	*Chorleywood College*															
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*P*
Transmitted maternal infections:																											
Congenital syphilis	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	2
Toxoplasmosis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—	1	1	2
Acquired causes:																											
Secondary optic atrophy	2	1	—	—	1	—	6	3	2	—	1	1	3	1	1	—	1	1	1	1	6	—	3	2	27	10	37
Injury and sympathetic	—	1	2	—	2	—	1	—	—	—	3	1	1	—	—	—	1	—	1	1	—	1	1	1	12	5	17
Ophthalmia neonatorum	1	1	—	—	—	1	—	2	3	1	1	—	—	—	1	—	—	—	—	—	—	1	1	1	7	7	14
Corneal ulceration	1	2	1	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	1	1	—	—	—	—	3	5	8
Iridocyclitis	—	1	1	—	—	1	1	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	3	3	6
Panophthalmitis	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	1	—	—	—	2	1	3
Purulent conjunctivitis...	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Trachoma	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Indefinite aetiology:																											
Optic atrophy (not otherwise specified)	3	1	1	1	2	—	3	—	7	3	—	1	5	5	—	—	2	1	6	4	—	—	5	2	34	18	52
Endophthalmitis	1	—	—	—	—	—	2	2	—	—	—	1	—	—	1	—	—	2	—	—	—	—	—	—	4	5	9
" Corneal degeneration "	—	—	—	—	—	—	—	—	2	2	1	1	—	—	—	—	—	—	—	—	—	—	—	—	3	3	6
Other affections and indefinite lesions	3	—	2	—	1	—	—	—	1	—	2	2	—	1	—	—	—	—	1	—	4	1	3	1	17	5	22
	63	49	25	14	26	16	57	56	35	33	26	27	50	27	12	9	18	19	30	22	34	20	38	17	414	309	723

TABLE 21

Causes of Blindness in Infants up to 5 years of age admitted to Sunshine Homes for Blind Babies, 1944–54

	1944	*1945*	*1946*	*1947*	*1948*	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*Total 1944–54*
Infections:												
Ophthalmia neonatorum	3	2	—	—	—	—	—	—	—	—	—	5
? Ophthalmia neonatorum	—	1	—	—	—	—	—	—	—	—	—	1
Measles	1	1	—	—	—	—	—	—	—	—	—	2
Corneal ulceration	—	—	1	—	—	—	—	—	—	—	—	1
Endophthalmitis	4	2	—	—	—	—	—	—	—	—	2	8
Meningitis	2	—	3	2	1	—	1	—	—	—	2	11
Diphtheria	—	1	—	—	—	—	—	—	—	—	—	1
Congenital syphilis	—	—	—	1	—	—	—	—	—	—	—	1
	10	7	4	3	1	—	1	—	—	—	4	30
Trauma:												
Accident	—	—	—	—	—	—	1	—	—	—	—	1
Enemy action	2	2	1	—	—	—	—	—	—	—	—	5
	2	2	1	—	—	—	1	—	—	—	—	6
Congenital:												
Congenital anomalies	2	4	5	4	1	—	4	1	1	2	1	25
Nystagmus	2	2	—	1	4	2	3	1	1	3	1	20
Microphthalmos	4	1	—	3	2	1	4	4	1	4	6	30
Anophthalmos	—	—	1	—	1	2	—	—	1	1	2	8
Buphthalmos	5	2	2	1	1	3	2	2	—	5	3	26
Absence or maldevelopment of optic nerve	1	1	1	—	—	1	—	—	—	—	—	4
Optic atrophy	4	5	7	4	3	3	2	2	4	—	5	39
Cataract...	7	7	5	3	4	3	7	4	6	5	10	61
Albinism	—	1	—	—	—	1	1	—	—	—	—	3
Glioma	3	3	3	3	4	7	4	—	8	2	5	42
Aniridia...	1	1	—	2	—	1	1	—	3	2	—	11
Coloboma	—	1	2	4	1	7	1	1	3	—	1	21
Pseudo-glioma	—	—	—	1	1	5	4	2	3	—	3	19
Retinal lesions	—	—	—	2	1	4	1	3	3	—	—	14
Corneal lesions...	—	—	—	—	2	—	3	—	—	—	—	5
	29	28	26	28	25	40	37	20	34	24	37	328

TABLE 21—*contd.*

Causes of Blindness in Infants up to 5 years of age admitted to Sunshine Homes for Blind Babies, 1944–54

	1944	*1945*	*1946*	*1947*	*1948*	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*Total 1944–54*
Other affections :												
Optic atrophy of indefinite origin ...	—	—	—	—	—	9	5	4	—	3	5	26
Detachment of retina	—	—	—	1	—	1	1	1	1	—	1	6
Cerebral blindness	—	—	—	3	—	1	—	—	1	1	—	6
Retrolental fibroplasia	—	—	—	—	1	2	5	14	39	31	53	145
Other affections and indefinite lesions	7	—	3	3	1	4	4	—	5	1	2	30
	7	—	3	7	2	17	15	19	46	36	61	213
Total	48	37	34	38	28	57	54	39	80	60	102	577

DURING THE six years and nine months, April 1st, 1948, to December 31st, 1954, a total of 74,292 new registrations were effected in England and Wales; a detailed analysis of 53,052 certificates issued over the seven years 1948–54 is available: 33,379 in the present study and 19,673 in the previous report on the years 1948–50. This extensive and unique material allows both an assessment of the problem of blindness as it exists at the mid-century and some evaluation of any movement that may be taking place—an evaluation facilitated by the not inconsiderable data available for the earlier years.

THE BLIND POPULATION

The increasing proportion and number of the aged in the blind population

In 1954, no less than 68·9 per cent of the newly registered blind were 70 years or more of age—a sharp increase over the 43·4 per cent recorded in 1937, when the age distribution of the newly registered first became available. The increase has been steady and progressive over the years, as shown in Table 22.

TABLE 22

Proportion of those aged 70 *years or more in the new registrations: England and Wales,* 1937–54

*Year**	*Number of newly† registered of known age*	*Percentage of newly registered aged* 70 *years and over*
1937	7,848	43·4
1938	8,359	44·3
1939	8,517	45·3
1940	7,096	48·2
1941	6,360	49·0
1942	7,024	54·9
1943	7,050	55·9
1944	6,064	53·5
1945	5,994	54·1
1946	6,612	57·1
1947	6,804	52·7
1948	7,558	53·4
1949	8,603	56·6
1950	10,641	61·3
1951	11,144	64·0
1952 (*a*)	11,450	63·7
1952 (*b*)	8,355	64·6
1953	11,546	65·4
1954	12,491	68·9

* For the period 1937–52 (*a*) the records are for the year ending on March 31st. Subsequently the records were for the calendar year; 1952 (*b*) therefore represents April 1st–December 31st of that year.

† Each year there were also a small number of unknown age, generally around 20 to 30 cases in the earlier years and around 10 in the more recent years.

It will be seen that the increasing proportion of the aged goes together with a marked increase in the total numbers, so that the proportionate increase of elderly amongst the blind is also a substantial numerical increase.

For the calendar years 1948—54 the certificates analysed give information on the age structure in the group of over 70 years. The available data (Table 23) show that there was considerable movement within this group: whilst the proportion of those aged 70–79 years has not changed much over these years, the proportion of octogenarians has risen steadily from 20·5 per cent to 31·5 per cent, and the proportion of nonagenarians from 2·2 per cent to 4·5 per cent. In all, no less than 36·0 per cent of the newly registered are now 80 years of age or more. In the two highest age groups there is a distinctly higher proportion of women, 38·9 per cent against 31·0 per cent for men. In general terms, amongst the newly registered 2 out of every 5 females, and 1 out of every 3 males, are over the age of 80.

TABLE 23

Blind certificates, 1948–54*: both eyes blinded by the same cause*
Percentages recorded for the age groups over 70 *years*

Age groups (in years)	*Males*			*Females*			*Persons*		
	70–79	*80–89*	*90 and over*	*70–79*	*80–89*	*90 and over*	*70–79*	*80–89*	*90 and over*
Year—									
1948 ...	32·9	18·5	1·0	33·4	21·9	3·1	33·2	20·5	2·2
1949 ...	33·1	20·4	1·9	34·9	25·4	3·6	34·2	23·4	2·9
1950 ...	36·1	22·3	1·5	37·5	26·5	2·7	37·0	24·8	2·2
1951 ...	34·6	22·1	2·0	35·4	27·8	3·9	35·1	25·6	3·2
1952 ...	32·5	24·6	2·0	35·9	28·2	4·7	34·7	26·9	3·6
1953 ...	34·9	24·7	2·1	33·8	30·4	4·3	34·2	28·2	3·5
1954 ...	32·5	28·0	3·0	32·3	33·5	5·4	32·4	31·5	4·5

It is likely that these developments are determined by social no less than by medical reasons. This is suggested by Table 24, which gives the source of reference in a sample analysis of new cases in 1951–54 registered with three

TABLE 24

Source of reference of cases for registration in a sample analysis, 1951–54

Age groups in years	*0–49*			*50–69*			*70 and over*		
	*London**	*Cornwall†*	*Yorkshire‡ West Riding*	*London**	*Cornwall†*	*Yorkshire‡ West Riding*	*London**	*Cornwall†*	*Yorkshire‡ West Riding*
Medical sources:									
Ophthalmologist ...	66	22	19	84	30	39	112	63	56
General practitioner	—	4	5	1	6	11	4	8	12
Lay sources:									
National Assistance Board	6	6	21	61	67	80	201	273	293
Other ...	41	11	75	57	23	199	130	26	433
	113	43	120	203	126	329	447	370	794

* Cases registered during the first quarter in each year, 1951–54.
† All cases registered during 1951–54.
‡ Sample of cases registered 1951–54.

different authorities, representing a typically urban, rural, and a mixed population. In all three areas only a small proportion of those registered at 70 years and over were referred by ophthalmologists or other medical agents. Reference by lay sources is the usual mode of gaining admission to the Blind Register. In Cornwall, no less than 73·8 per cent of the newly registered aged blind came through the National Assistance Board, other lay agencies playing a small part. In the West Riding of Yorkshire, as much as 91·4 per cent of all registrations came from lay sources, the National Assistance Board being responsible for some 37 per cent. In London, the National Assistance Board was responsible for 45·0 per cent, and other lay sources for a further 29·0 per cent.

The increasing number of blind children

Children of school age

By 1947 when there were an estimated 6,160,000 children aged 5–15 years in England and Wales, the decline in the number of children of school age that had been going on for several decades had come to an end. Since then the numbers have risen steadily to an estimated 7,201,000 in 1954. With a stationary rate of blindness in school children—and in the previous studies it was shown that the striking decline in the incidence of blindness in school children that had occurred in the twenties and thirties had come to an end by about 1943—the additional 1,000,000 or so of children over the nine years 1946–54 could be expected to contribute some 200 blind, so that against the 1,375 blind children recorded for 1946, there would be some 1,575. Actually, as can be seen from Table 25, the increase in the number of blind children of school age has been rather higher; the rate per 100,000 is now rising, even if slightly. The increase is similar for boys and girls, but the rate of blindness is distinctly higher for boys.

TABLE 25

Incidence of Blindness in Children aged 5–15 *years: England and Wales*, 1947–54

	Estimated Population aged 5–15 years (in thousands)*			*No. of registered† Blind aged 5–15 years*			*Rate per 100,000*		
	M	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*
Years									
1947	3,133	3,027	6,160	792	546	1,338	25·3	18·0	21·6
1948	3,165	3,053	6,218	789	539	1,328	24·9	17·7	21·3
1949	3,224	3,109	6,333	795	574	1,369	24·7	18·5	21·6
1950	3,289	3,163	6,452	789	575	1,364	24·0	18·2	21·1
1951	3,345	3,219	6,564	800	596	1,396	23·9	18·5	21·3
1952	3,501	3,362	6,863	844	659	1,503	24·1	19·6	21·9
1953	3,605	3,458	7,063	873	666	1,539	24·2	19·3	21·8
1954	3,679	3,522	7,201	907	705	1,612	24·7	20·0	22·4

* Mid year.

† As at March 31st for the years 1947–51 inclusive; as at December 31st for 1952 and subsequently.

Children below the age of 5

With relatively slight fluctuations in the infant population there has been a heavy and almost progressive increase in the number of children registered below school age. This is shown in Table 26. As compared with 1937–47, some three to four times as many babies under 1 year are now being registered, and some two to three times as many infants aged 1–4 years.

There were no obvious administrative or social influences to explain this marked increase in recent years.

TABLE 26

New registrations at 0–4 *years,* 1937–54

		Numbers registered	
		Under 1 year	*At 1–4 years*
1937–47	*average:* *range:*	*14·1* *9 to 22*	*59·9* *44 to 74*
Year ending—			
March 31st, 1948		23	83
1949		21	118
1950		34	122
1951		44	136
1952		74	164
December 31st, 1952		42*	102*
1953		55	147
1954		51	153

* For the 9 months April 1st–December 31st, 1952.

The trend at the different age groups

A rate of blindness per 100,000 is feasible for school children since the requirements of education make registration virtually compulsory in this age group. For the rest of the population any computation of such rates is of little value because an unknown and possibly variable proportion in the different age groups do not seek registration. Trends of some validity can, however, be established by assessing the rate of new registrations in the different age groups over some years. Table 27 gives such rates for the different age groups excluding school children.

It is seen that in comparison with 1937–40 (the rates for the intervening period of 1941–46 have to be treated with some reserve owing to the disturbances produced by the war) there were in 1947–54:—

(i) a declining rate during the active years of life (16–69 years);

(ii) a substantial increase in the rates for those aged 70 years or more;

(iii) a substantial increase in the rates for infancy ($<$ 1 year) and early childhood (1–4 years).

Over the shorter period of the four years 1951–54 (Table 28) the changes were slight, the most significant being a marked increase in 1954 in the rate for those aged 70 years or more, and possibly also a decrease in the rate for infants up to 1 year.

The female excess amongst the blind

As can be seen from Table 28, the rates for new registrations per 100,000 of the population are consistently higher for women than for men in the age groups over 65 years. The trend probably sets in at about 50, whilst up to 40 the trend is towards a higher rate for males.

TABLE 27

New registrations, 1937–54*

Rates per 100,000 *in different age-groups over three periods of years*

	Average annual population† (in thousands)			*Average annual number of new registrations*			*Rates per 100,000§*		
	1937–40	*1941–46*	*1947–54*	*1937–40*	*1941–46*	*1947–54*	*1937–40*	*1941–46*	*1947–54*
Age groups									
<1	587	645	719	13	14	40	2·2	2·2	5·6
1–4	2,249	2,358	2,849	55	63	120	2·4	2·7	4·2
5–15	6,600	6,234	6,607	137	127	145	—	—	—
16-19‡	2,820	2,497	2,265	94	77	66	3·3	3·1	2·9
20-39‡	13,388	13,443	12,783	452	329	390	3·4	2·4	3·0
40-49	5,501	5,950	6,510	519	336	416	9·4	5·6	6·4
50-64	6,722	6,985	7,373	1,890	1,190	1,530	28·1	17·0	20·8
65-69	1,544	1,691	1,821	1,224	855	1,105	79·3	50·6	60·7
70 and over	2,118	2,479	2,987	3,597	3,528	6,206	169·8	142·3	207·8

* New registrations are recorded for 1937–1952 as for the years ending at 31st March. For 1953 and 1954 the registrations during the calendar year are recorded. The records for the 9 months April 1st–December 31st, 1952, are omitted. The figures given represent the annual average for the period to the nearest full figure.

† Total population. Averages of mid-year estimates.

‡ Population for ages 16–19 and 20–39 years (as shown), but number blind is recorded for 16–20 and 21–39 years; the rates per 100,000 shown are only comparative, being obtained by ignoring the discrepancy in the groupings of the ages.

§ The rates for children aged 5–15 years are not given as the more reliable annual rates for the blind population of school age are available (see Table 25 and previous studies, Sorsby 1950 and 1953).

TABLE 28

New registrations, 1951–54

Annual rates per 100,000 *by sex and age groups**

Year:	*Males*				*Females*				*Persons*			
	1951	1952	1953	1954	1951	1952	1953	1954	1951	1952	1953	1954
Age group:												
0–1 ...	11·9	7·2	9·1	8·2	10·1	10·0	7·4	7·0	11·0	8·5	8·2	7·6
1–4 ...	5·6	4·7	5·8	6·2	5·2	4·8	5·0	5·3	5·4	4·8	5·4	5·8
5–15 ...	—	—	—	—	—	—	—	—	—	—	—	—
16–19†...	3·6	3·6	3·5	3·0	2·4	1·9	2·6	1·9	3·0	2·8	3·1	2·4
20–29†...	3·2	2·8	2·3	2·8	1·7	2·2	1·6	1·8	2·5	2·5	2·0	2·3
30–39†...	3·9	3·7	3·7	3·5	2·9	2·2	2·9	2·7	3·5	2·9	3·3	3·1
40–49 ...	6·4	6·1	6·2	5·4	6·3	5·4	5·9	5·5	6·3	5·7	6·1	5·5
50–59 ...	16·4	16·0	14·7	13·9	17·8	15·5	16·0	15·7	17·2	15·6	15·4	14·8
60–64 ...	36·4	36·7	32·4	33·6	35·1	34·5	36·2	36·8	35·7	35·6	34·5	35·4
65–69 ...	61·4	60·4	59·2	51·5	71·7	70·9	75·0	73·1	67·3	66·4	68·3	64·0
70 and over	220·2	219·6	226·8	245·5	257·1	242·7	251·3	284·4	242·4	233·6	241·7	269·3

* Based on the new registrations recorded in Table 2 and the estimated mid-year population for each year as supplied by the Registrar General.

The year 1951 represents new registrations for the year ending March 31st, 1952.

The year 1952 represents the 9 months April 1st–December 31st, 1952, adjusted for the whole year.

The years 1953 and 1954 are full calendar years.

† Population as shown; blind 16–20, 21–30 and 31–39 years. See also footnote (‡) to previous Table.

Whether these differences represent a real sex difference in blindness, or are determined by social factors, is uncertain. But the higher rate for women in the higher age groups helps to explain the marked female excess in new registrations at the higher ages, which is, however, mainly determined by the fact that there are many more women in the general population at the higher age groups. The 1951 Census showed 1,184 females to 1,000 males at 50–59 years and the female sex ratio per 1,000 males rose to 1,309, 1,435 and 1,784 in the three succeeding decades, and to 3,000 at 90 years and over.

CAUSES OF BLINDNESS

Data on the degree of blindness and on the proportionate percentages of the causes of blindness at the different age groups are given in Tables 4, 8 and 10. Some of the more significant findings are recorded diagrammatically in the frontispiece whilst Table 29 gives computed annual numbers for 1951–54 for the different causes at the different age groups.

Blindness in the elderly

As can be seen from Table 10, three affections account for nearly 80 per cent of the blind aged 70 years and over—the age group that contributes just under two thirds of the new registrations during 1951–54 (actually 66·3 per cent). Cataract accounts for 33·7 per cent, senile macular lesions for 30·4 per cent, and glaucoma for 14·9 per cent; lesser causes are myopia, diabetes and the cardiovascular affections with 5·8 per cent, 3·6 per cent and 3·2 per cent respectively.

As is shown in Table 8, there are considerable variations over the three decades covered by this age group. In the highest age group—those aged 90 years and over—two affections, cataract and the senile macular lesions, are almost exclusively the causes of blindness, cataract showing the heavier proportion (47·6 per cent against 38·4 per cent); glaucoma is the remaining significant cause with 7·3 per cent. In the preceding decade—the age group 80–89 years—conditions are not dissimilar, except that the proportionate incidence of cataract is rather lower and that of glaucoma is now 12·4 per cent of cases. At 70–79 years, whilst cataract and the senile macular lesions are still the leading causes (with 28·4 per cent and 24·7 per cent), glaucoma with 17·8 per cent is a substantial cause of blindness; myopia, diabetes and cardiovascular affections together contribute 17·9 per cent of cases.

A clearer appreciation of the significance of these various causes at the different age groups is given by the adjusted data in Table 29. Here the findings recorded in the analysis of blind certificates 1951–54 are applied to all new registrations. It is seen that on an assumed average of 11,658 new registrations per year, some 7,700 would be aged 70 years or more, of whom some 4,000 would be 70–79 years of age, nearly 3,300 would be 80–89 years, and some 400 would be 90 years or more. Of a total of 3,067 registrations as blind from cataract, nearly half would be aged 80 years or more. Similarly nearly half of the 1,585 registered as blind from glaucoma would be concentrated in the age group 70–79 years.

Blindness during the active years of life

Of the total blind population, 23·8 per cent fell into the age group of 50–69 years and 7·1 per cent were distributed over the ages of 15–49 years.

TABLE 29

Computed number of blind in England and Wales given by causes of blindness responsible for 2·5 per cent or more of cases at any age group: annual average for 1951–54*

Causes	*Age group*										*90 years and over*	*All ages*†
	0–4	*5–15*	*16–20*	*21–30*	*30–39*	*40–49*	*50–59*	*60–69*	*70–79*	*80–89*		
Congenital anomalies	174	84	26	27	34	42	35	—	—	—	—	489
Abiotrophic defects	5	17	12	24	32	53	59	56	—	—	—	303
Myopia	—	5	2	8	21	59	164	290	317	118	—	979
Glaucoma	—	—	—	—	—	20	97	325	705	405	31	1,585
Cataract	—	—	—	—	—	16	92	378	1,124	1,252	205	3,067
" Primary " retinal detachment	—	—	—	5	7	12	21	—	—	—	—	93
Intraocular tumour	7	—	—	—	—	—	—	—	—	—	—	12
Congenital syphilis	—	—	—	4	9	17	—	—	—	—	—	82
Tuberculosis	6	4	2	—	—	—	—	—	—	—	—	23
All trauma	—	—	—	8	6	—	—	—	—	—	—	82
Vascular diseases	—	—	—	—	—	10	31	94	162	—	—	384
Diseases of central nervous system ...	—	4	2	8	12	12	—	—	—	—	—	58
Intracranial neoplasm	—	13	4	11	11	15	—	—	—	—	—	93
Diabetes	—	—	—	9	15	32	104	275	230	—	—	699
Senile macular lesions	—	—	—	—	—	—	—	186	978	1,184	166	2,542
Optic atrophy of unknown origin ...	—	5	4	8	7	17	30	—	—	—	—	222
Iritis and iridocyclitis	—	—	2	7	17	25	50	72	—	—	—	291
Corneal lesions of indefinite aetiology ...	—	—	—	—	—	11	25	—	—	—	—	187
Choroidal lesions of indefinite aetiology	—	—	—	—	—	11	—	—	—	—	—	70
Affections of the globe of indefinite aetiology	—	—	—	—	6	12	23	—	—	—	—	187
All other causes	17	14	7	19	27	26	119	320	445	312	30	210
Totals...	209	146	61	138	204	390	850	1,996	3,961	3,271	432	11,658

* Computed on these assumptions and adjustments:

(*a*) the returns for the year ending 31st March, 1952, have been taken to stand for the calendar year 1951 and the returns for April–December, 1952 (adjusted by the factor 4/3) to represent the calendar year 1952; no adjustment was needed for 1953 and 1954.

(*b*) that the proportionate incidences for the different causes obtained in the 92·3 per cent. of all cases that showed the same cause in the two eyes could be applied without serious error to all cases (except that the incidence of trauma as a blinding cause is underestimated). Each age group was adjusted by its own ratio to obtain the annual averages shown.

† Total of known age including cases where the cause gave less than 2·5 per cent. in a particular age group.

(i) *The age group* 50–69 *years*

This age group gives a computed annual number of 2,846 blind and the causes of blindness show many of the features seen in the elderly. Cataract and glaucoma are the major causes with 16·5 per cent and 14·9 per cent, but incidences of the same order are given by myopia and diabetes (15·9 and 13·3 per cent respectively). The senile macular lesions are less significant, whilst congenital and abiotrophic anomalies, and iritis and iridocyclitis are more marked than at the higher ages.

Actually these proportions are largely determined by the age group 60–69 years, which gives about two and a half times as many cases as the age group 50–59 years. In this latter group, myopia and diabetes are the outstanding causes with 19·3 per cent and 12·2 per cent of cases, whilst in the age group 60–69 cataract and glaucoma predominate with 19·0 per cent and 16·3 per cent. This combined age group therefore presents the same cataract problem as is seen in the elderly—though to a much smaller extent. The computed data in Table 29 show that out of a total annual number of 2,846 in this age group, the number of blind from cataract was 92 at 50–59 years and 378 at 60–69 years. Glaucoma is as significant in this age group as cataract; it first emerges with a considerable number of cases in the age group 50–59 years, and the succeeding decade contributes some three times as many (97 and 325 cases respectively).

The affections that tend to reach their peak in this age group are myopia and diabetes which contribute 454 and 379 cases respectively, so that apart from these two disorders, the age group 50–69 years presents no special problems: it shows in a declining form the causes operative amongst younger patients, and in a rudimentary form those seen in the aged.

(ii) *The age group* 15–49 *years*

The 7·1 per cent of the blind in these age groups are concentrated in a few substantial causes.

In the age group 15 to 29 years congenital defects, abiotrophic anomalies and myopia together account for some 50 per cent of all cases, whilst a group of essentially neurological disorders (diseases of central nervous system, intracranial neoplasms and optic atrophy of unknown origin) contribute 18·5 per cent. In this age group, diabetes emerges with 4·7 per cent and trauma with 4·3 per cent. The computed annual numbers shown in Table 29 give about 100 cases of congenital, abiotrophic and myopic anomalies, and some 37 cases of blindness due to neurological disorders.

In the age group 30 to 49 years the congenital and abiotrophic anomalies together with myopia contribute 40·4 per cent of cases: this would give about 250 cases annually in this age group. The neurological group (as defined above) accounts for 12·6 per cent—or some 75 cases—whilst iritis and iridocyclitis contribute 7·1 per cent and a rather similar proportion is given by diabetes—a computed 42 and 47 cases respectively. Glaucoma and congenital syphilis each contribute about 4·0 per cent of cases and trauma some 2·4 per cent.

During the period 15–49 years, which contributes a computed 793 cases annually, the significant problems are therefore the congenital and abiotrophic anomalies including myopia, the neurological group of affections, iritis and iridocyclitis, and diabetes—contributing in all some 560 cases annually. In addition—as indicated in Table 10—trauma is a significant cause in males: for a computed annual total of 433 in this age group there were 22 cases blinded by trauma.

Blindness in childhood

Children up to 14 years contributed only 2·8 per cent of the new registrations during 1951–54.

(i) *Children of school age* (5–14 *years*)

It has been seen from Table 8 that 57·6 per cent of those registered during school life showed congenital and developmental anomalies and 11·5 per cent abiotrophic defects. The neurological group of affections contributed substantially: intracranial tumours 9·3 per cent, diseases of the central nervous system 2·5 per cent, and optic atrophy of unknown origin 3·4 per cent—a total of 15·2 per cent.

The data from Schools for the Blind analysed in Table 20, apart from emphasizing the high incidence of optic atrophy, confirm the predominant role of the congenital and hereditary defects. Amongst these, the outstanding lesions are cataract and the retinitis pigmentosa group. Buphthalmos shows the considerable incidence of 8·9 per cent. Retinoblastoma with its dominant mode of inheritance and serious personal and social aspects accounts for as much as 6·2 per cent. It is noteworthy that of the 14 children recorded as blind from ophthalmia neonatorum 13 were born before 1944.

In terms of numbers this age group contributes some 150 cases a year, more than half being cases of congenital defects, whilst the neurological affections give an annual average of some 20 cases.

Some assessment of the relative significance of environmental and genetic causes of blindness was possible from the data from the Schools for the Blind. The various head teachers of these schools were asked to record a family history of blindness in such cases where it was known to them. In no less than 118 children was such a family history known. In 53 cases evidence of dominant inheritance was available; in 39 instances a sib was affected and in 17 more the family history was rather more vague, the only information available being that there was blindness in the family. Amongst these 118 children there were 9 who had one or more sibs at schools for the blind. The actual distribution of the positive family history so obtained is shown in the summary table overleaf (Table 30).

It will be seen that on lay information some 17 per cent of the children were regarded as showing genetic affections. This is likely to be a serious underestimate for the not uncommon isolated cases of recessive disorders would be overlooked.

In this assessment, dominant disorders are inevitably rather prominent and this is unlikely to be true, for the recessive disorders are probably much more common. The findings in Table 30 stress that aniridia and cataract are essentially dominant affections, retinitis pigmentosa and the allied conditions essentially recessive and optic atrophy shows both modes of inheritance. The dominant character of retinoblastoma is also brought out.

The returns on Schools for the Blind also contained data on 170 partially sighted children. The distribution of causes followed very closely that seen in children at Schools for the Blind, except that the incidence of environmental and indefinite causes was rather lower amongst the partially sighted. No less than 153 out of the 170 children showed the affections grouped as congenital and hereditary anomalies.

(ii) *Infants below school age* (0–4 *years*)

In infants, congenital anomalies account for 83·3 per cent of all cases; a further 2·6 per cent is contributed by the abiotrophic defects, and 3·1 per cent by retinoblastoma. Environmental causes of blindness have therefore become exceptional. The high percentage contributed by congenital anomalies includes cases recorded as retrolental fibroplasia. In Table 16 these cases have been distinguished from each other and it is seen that retrolental fibroplasia contributed 206 cases against 304 cases of all types of congenital defect.

TABLE 30

Incidence of positive family histories as reported by the Head Teachers amongst children at Schools for the Blind in 1954 *recorded in Table* 20

	Reported history of the same affection or of blindness in:		
	Parents	*Sibs*	" *Family* "
Cataract	28	1	—
Optic atrophy	5	6	3
Retinitis pigmentosa and allied conditions ...	—	10	2
Aniridia	6	—	1
Nystagmus	2	2	1
Buphthalmos	—	3	1
Myopia	2	1	1
Corneal dystrophy	3	1	—
Retinoblastoma	2	2	—
Macular coloboma	1	1	1
Retinal detachment	1	1	1
Albinism	—	3	—
Subluxation of lens	1	1	1
Microphthalmos	—	3	—
Retrolental fibroplasia	—	1*	—
" Endophthalmitis "	—	—	1
Pseudoglioma	—	1	—
Congenital defects, not specified	2	2	4
	53†	39†	17†

* Identical twins.
† A total of 109 index cases in a series of 118 children.

The records from the Sunshine Homes (Table 21) with their fuller data show that:

(1) Blindness from infectious disease has been virtually eliminated.

It is particularly noteworthy that ophthalmia neonatorum—only recently the largest single cause of blindness—did not contribute any cases at all during the five years 1950–1954. Of the five cases recorded as due to infectious disease during 1950 to 1954, three were cases of optic atrophy from tuberculous meningitis—a new cause of blindness in the sense that such children would not have survived before the present-day antibiotic treatment became available; the remaining two babies are recorded as blind from endophthalmitis.

(2) The substantial group of frankly congenital defects—115 cases during 1951–54—gives a few well defined categories.

Congenital cataract was the commonest anomaly with 25 cases; microphthalmos and retinoblastoma each contributed 15 cases; congenital optic atrophy accounted for 11 cases (there were also 12 cases of optic atrophy of undetermined origin) and buphthalmos for a further 10.

(3) Retrolental fibroplasia has emerged as the most substantial cause of blindness in infants overshadowing even the congenital defects.

> At the Sunshine Homes the affection first appeared in 1948 and 1949 with 1 and 2 cases respectively, but in the five years 1950 to 1954 no less than 142 infants were admitted.

As can be seen from Table 29, infants under the age of 5 now contribute annually over 200 cases; most of these are blind at birth or soon after. It is, however, likely that in this age group in particular the numbers registered fall far short of the number blind.

Some other aspects

The blind under 50

With a clear appreciation of the extent and causes of blindness seen in the aging and the elderly, an overall survey of blindness as it occurs up to the age of 50 is of some interest.

In numbers the computed annual average of new registrations would be of the order of some 1,200, of whom nearly a third would be concentrated in the ten years 40–49. As to the degree of blindness, the earlier years would contain a high proportion of the totally or sub-totally blind. The causes operative would be concentrated into a few categories, over 30 per cent being congenital anomalies, some 15 per cent abiotrophic defects, whilst myopia would account for some 8 per cent and detachment for some 2 per cent. Diabetes, intracranial tumours, and iritis and iridocyclitis each account for some 5 per cent, whilst diseases of the central nervous system and optic atrophy of unknown origin each contribute about 4 per cent; congenital syphilis gives some 2 per cent of cases, mostly in the age group 40–49 years.

The congenital and abiotrophic anomalies including myopia and detachment are therefore responsible for some 55 per cent of cases, whilst a group of general medical disorders account for a further 25 per cent of cases.

Trauma

An adequate measure of the significance of trauma as a cause of blindness must take into account not only the 80 or so people blinded by injury in both eyes, but also the high incidence of trauma—some 20 per cent—as a cause of blindness amongst those blinded by a different cause in the two eyes. So viewed there are registered each year some 430 people who have lost one or both eyes from injury. In these, injury (or injury and sympathetic ophthalmia) was the exclusive cause in some 90 cases, whilst in some 340 another factor—generally cataract or glaucoma—also came into play. Taking trauma as a whole, some 50 per cent of the cases were non-industrial injuries.

Sympathetic ophthalmia

The widely recognised significance of cataract surgery as a cause of sympathetic ophthalmia is borne out by the fact that some half the cases of blindness from sympathetic ophthalmia are recorded as following on cataract operation. It is, however, perturbing to find that for every six cases of sympathetic ophthalmia following cataract extraction, one case is recorded following operation for glaucoma—all the more perturbing as there has been no decline in this proportion compared with the findings previously recorded. In the present series of 11 cases there are not sufficient details on the type of operation, except that iridencleisis is recorded in two cases (as it was in 5 out of the 10 cases in the previous series). The high incidence following non-industrial trauma in males, repeats the findings recorded in the previous study, and suggests the need for further investigation.

Retrolental fibroplasia

A full assessment of the number of infants blinded by retrolental fibroplasia is difficult, if only because registration is frequently delayed and there is as yet little information on how many infants become registered only when they reach school age. Assuming that the registrations up to the age of 5 are reasonably adequate, there is one fairly full year available—the year beginning around the middle of 1950. It will have been seen from Table 17 that in 1951 thirty-one infants under the age of 1 year were registered as blind from retrolental fibroplasia, that in the following year 21 were registered as aged 1 to 2 years, and in 1953 another 8 as aged 2–3 years, whilst in 1954 six were registered as 4–5 years, giving a total of 66. In addition there may be some still to be registered at the age of 5 in 1955, and some may not become registered until later still. Furthermore an additional number—roughly assessed as probably as much as another 20, for the certificates analysed represent only some 70 per cent of those issued in England and Wales during the period under review—must be added. In that one year retrolental fibroplasia has therefore blinded some 85 babies. Whether that year was unusual is not certain, but is likely for two reasons. In the first place the number registered under the age of 1 as blind from retrolental fibroplasia was high in 1951—distinctly higher than in 1954, and also rather higher than in 1952 and 1953. Secondly, the number of infants registered as blind was exceptionally high for the year ending March 1952—close to the period for which the estimate of some 85 is made. Whilst the available evidence is inconclusive it would seem that there has been a decline from a peak incidence around 1950–51.

Assuming that the increase in the number of registrations of infants under 5—an increase that first set in in 1948—is due to retrolental fibroplasia, and making allowance for the increase in the number of infants in the general population, a rough estimate of the number of babies blinded by retrolental fibroplasia since 1948 becomes possible. From April 1st, 1947, to December 31st, 1954, some 200 infants under the age of 1 and some 435 infants aged 1–4 were registered in excess of what would have been the normal registration figures on the basis of the averages for 1938–47. This gives some 635 cases of retrolental fibroplasia—an average of more than 80 a year. This figure, however, may be excessive owing to a greater readiness on the part of parents to seek registration of infants blinded by other causes than retrolental fibroplasia—a trend probably neutralised by the possibility that a number of children blind from retrolental fibroplasia have not yet come to registration. By 1958–59, the Schools for the Blind, instead of catering as in recent years for some 1,400 children, will have to provide accommodation for some 2,200 children, or possibly more, of whom some 600 will have been blinded by retrolental fibroplasia.

THE PAST

During the third of a century in which the Blind Persons Act of 1920 has been operative, there have been considerable changes in the age structure of the general population, in the incidence of some of the blinding affections, and also in such less tangible things as the attitude of patients and of certifying examiners. These changes are all reflected in the structure of the blind population today.

The changing age structure of the general population

Between 1921 and 1951, the population of England and Wales rose from some 38 to 44 millions. This increase went with a considerable shift in the

TABLE 31

Changes in the number and age distribution of the general population and of the blind population since 1921

(*a*) *The age distribution of the population*, 1921–51 *and a forecast for* 1973
(*Numbers in thousands*)

Returns for:	*Census, 1921*		*Census, 1931*		*Mid-year Estimate, 1939*		*Census, 1951*		*Projection, 1973**	
	No.	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*
Age groups in years:										
0–14	10,501	27·7	9,520	23·8	8,728	21·0	9,691	22·2	9,251	20·0
15–64	25,095	66·3	27,469	68·8	29,012	70·0	29,242	66·8	30,179	65·4
65 and over	2,291	6·0	2,963	7·4	3,720	9·0	4,825	11·0	6,745	14·6
	37,887	100·0	39,952	100·0	41,460	100·0	43,758	100·0	46,175	100·0

* General Register Office, 1954.

(*b*) *The blind population in some age groups at* 10 *yearly intervals between* 1923 *and* 1953

Returns for:	*1923**		*1933**		1943*		1953†	
	No.	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*
Age groups in years:								
0–4	231	0·6	244	0·4	217	0·3	587	0·6
5–15	2,723	7·6	2,089	3·3	1,355	1·8	1,539	1·7
16–49	12,522	34·9	16,568	26·2	15,883	20·8	14,672	16·2
50–69	12,397	34·5	25,066	39·6	27,983	36·7	27,983	30·9
70 and over	8,026	22·4	19,277	30·5	30,884	40·4	45,802	50·6
	35,899	100·0	63,244	100·0	76,322	100·0	90,583	100·0
Not stated	619		164		185		23	
	36,518		63,408		76,507		90,606	

* At 31st March. † At 31st December.

age distribution, the proportion of children under 15 falling substantially and that of those over 65 years rising markedly. This is seen in Table 31 (a), which shows:—

(1) The number of children up to 15 fell progressively until 1939 (or later), whilst by 1951 there had set in an increase both in the proportionate percentage and in numbers.

(2) The rising proportion of those aged 15–64 until 1939 and the subsequent decline represents an actual increase in numbers—some 4 million between 1921 and 1951.

(3) The greatest changes have occurred in the age groups of 65 years and more. In this period the proportion has risen from 6·0 per cent to 10·9 per cent, and the numbers from 2¼ to 4¾ millions.

On population figures one would expect some decline in the number of blind children, some increase in the number of the blind aged 15–64, and an increase of more than double in those aged over 65. The changes that have actually occurred are shown in summary form in Table 31 (b), in which the blind population of 1923 is contrasted to that of 1933, 1943 and 1953. It is seen that:

(1) the number of blind infants up to 4 showed little change till the marked rise in recent years, whilst that of blind children aged 5–15 fell drastically between 1923 and 1943, to rise slightly in recent years;

(2) the number of blind aged 16–49 has shown little change between 1923 and 1953, whilst the blind aged 50–69 rose steeply between 1923 and 1933 with little change subsequently;

(3) the number registered at 70 and over has continued to rise steeply throughout the period.

It is thus clear that changes in the age structure of the general population do not by themselves explain the marked changes in the number and age structure of the blind population.

Changes in the causes of blindness

Substantial data on the causes of blindness are available from the analysis of blind certificates for the years since 1933, and there are additional data for children for some years further back.

(a) *Data from Blind Certificates*

Allowing for the fact that the data for 1933–43 are based on a less satisfactory sample than those for the subsequent years, it is seen from Table 32 that substantial changes have occurred in the causes of blindness between 1933–43 and 1951–54. The intervening period, 1948–50, on the whole gives intermediate figures between the two extreme periods. The outstanding change is the disappearance of three infectious causes of blindness since 1933–43: ophthalmia neonatorum, syphilis, both the congenital and the acquired type, and meningitis which in the early period figured significantly, no longer appear as substantial causes for the later period.

The virtual elimination of the infectious causes of blindness tends to give a higher proportionate significance to the congenital and abiotrophic defects. In recent years trauma, optic atrophy from intracranial tumours, iritis and iridocyclitis, have all assumed more significant places with a relatively stationary number over the years. In contrast, diabetes in the middle aged and the senile macular lesions in the elderly have assumed a more significant place owing to an actual increase in numbers. The increase in the senile macular lesions reflects the increase in the number of elderly amongst the newly registered, and has brought with it a reduction in the proportionate significance of cataract at the higher age groups.

TABLE 32

Major causes of blindness at different age groups in 1933–43, 1948–50† and 1951–54‡*
Causes showing 5·0 per cent or more of cases at any age-group in any one of the three periods

Age-group:	*0–4*			*5–14*			*15–29*			*30–49*			*50–69*			*70 years and over*		
Period:	*1933–43*	*1948–50*	*1951–54*	*1933–43*	*1948–50*	*1951–54*	*1933–43*	*1948–50*	*1951–54*	*1933–43*	*1948–50*	*1951–54*	*1933–43*	*1948–50*	*1951–54*	*1933–43*	*1948–50*	*1951–54*
Number:	*101*	*291*	*579*	*213*	*186*	*323*	*1,034*	*422*	*554*	*2,314*	*1,242*	*1,636*	*6,545*	*4,676*	*7,173*	*6,893*	*10,732*	*19,941*
Congenital defect	59·5	77·7	83·3	62·5	57·5	57·6	38·7	33·2	27·3	21·5	13·5	12·7	7·4	3·7	2·3	—	—	—
Abiotrophic anomalies		4·1	2·6		7·0	11·5		16·3	18·2		12·1	14·4		3·3	4·1	—	—	—
Myopia ...	—	—	—	—	—	—	—	6·9	—	14·7	14·3	13·3	16·1	15·7	15·9	5·9	10·2	5·8
Glaucoma ...	—	—	—	—	—	—	—	—	—	—	—	—	14·7	14·7	14·9	18·0	15·8	14·9
Cataract ...	—	—	—	—	—	—	—	—	—	—	—	—	18·0	20·3	16·5	43·0	41·1	33·7
Ophthalmia neonatorum	9·9	—	—	6·1	—	—	12·2	—	—	6·4	—	—	—	—	—	—	—	—
Syphilis:																		
Congenital ...	—	—	—	—	—	—	13·7	—	—	11·1	—	—	—	—	—	—	—	—
Acquired ...	—	—	—	—	—	—	—	—	—	6·3	—	—	—	—	—	—	—	—
Meningitis ...	6·9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All trauma ...	—	—	—	—	—	—	—	5·2	—	—	—	—	—	—	—	—	—	—
Diseases of central nervous system ...	—	—	—	—	5·4	—	—	—	—	—	—	—	—	—	—	—	—	—
Intracranial tumour	—	—	—	—	5·4	9·3	—	6·2	7·8	—	—	—	—	—	—	—	—	—
Diabetes ...	—	—	—	—	—	—	—	—	—	—	5·3	7·9	—	8·4	13·3	—	—	—
Senile macular lesions ...	—	—	—	—	—	—	—	—	—	—	—	—	—	5·2	7·2	13·1	22·9	30·4
Iritis and iridocyclitis ...	—	—	—	—	—	—	—	5·0	—	6·6	8·9	7·1	6·2	5·6	—	—	—	—
Optic atrophy of unknown origin	7·9	5·1	—	—	5·4	—	—	6·6	6·0	—	5·2	—	—	—	—	—	—	—
All other causes	15·8	13·1	14·1	31·4	19·3	21·6	35·4	20·6	40·7	33·4	40·7	44·6	37·6	23·1	25·8	20·0	10·0	15·2
	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

* Sorsby, A. (1950). † Sorsby, A. (1953). ‡ Present study.

(b) *Data from Schools for the Blind and Sunshine Homes*

The disappearance of infectious diseases as causes of blindness in childhood is stressed by the analysis of the data at Schools for the Blind since 1922.

At provincial schools for the blind (Table 33) the congenital anomalies accounted for 72·4 per cent of all cases in 1954 against 30·8 per cent in 1922, with an intermediate incidence in 1944. The virtual elimination of the frankly infectious causes of blindness is emphasized by comparing the proportions seen in 1922 with those seen in 1944 and still more strikingly with those seen in 1954.

TABLE 33

Comparative incidence of the more significant causes of blindness seen in surveys at Provincial Schools for the Blind in 1922, 1944 *and* 1954

	1922*	1944†	1954‡
Total Number:	927	524	723
Ophthalmia neonatorum	30·4	9·2	1·9§§
Purulent ophthalmia of later years	2·5	—	0·1
Phlyctenular ophthalmia	3·7	0·2	—
Interstitial keratitis	4·1	0·9	0·3
Iridocyclitis	2·5	0·8	0·8
Optic atrophy	12·9	5·3	7·2§
Myopia	6·4	12·6	2·8
Congenital anomalies	30·8	55·0	72·4‖
Indefinite affections and others	6·7	16·0	14·5
	100·0	100·0	100·0

* Board of Education, 1922.

† Sorsby, A. (1945).

‡ Present survey.

§ Optic atrophy of unknown origin, excluding congenital optic atrophy and hereditary optic atrophy.

§§ 14 cases ; 8 born before 1940 ; 5 born between 1940 and 1944 ; 1 born in 1947.

‖ Including 7 cases of retrolental fibroplasia.

At Sunshine Homes, with their infants under the age of five, the findings are even more emphatic.

This can be seen from Table 34, based on records on 1,177 infants admitted since the first Sunshine Home was opened in 1920. In all, 1,217 infants have been admitted to these Homes up to the end of 1954, but some of the earlier records are not adequate; data on admissions from 1920–43 are recorded elsewhere (Sorsby, 1945), whilst Table 20 gives information for each of the subsequent years.

The elimination of infectious diseases, the emergence of retrolental fibroplasia, the increasing significance of congenital anomalies, and a possible actual increase in cases of retinoblastoma are the outstanding features.

PROSPECTS AND TASKS

Prospects

Numbers

During the twenty years 1935–54 the blind population increased by some 27,000, rising from some 67,000 to some 94,000. An increase of about double this dimension is likely to occur during the next twenty years, raising the blind population to about 140,000 or more.

TABLE 34

Summary table showing the numbers recorded for the major causes of blindness in infants up to 5 years of age admitted to Sunshine Homes for Blind Babies over some periods of years during 1920–54

Period:	1920–29*		1930–39*		1940–49*†		1950–54†	
Causes:								
Infections:								
Ophthalmia neonatorum ...	70		38		16		—	
Other	45		49		34		5‡	
		115		87		50		5‡
Trauma		3		5		13		1
Congenital anomalies:								
Glioma	7		14		29		19	
Other	77		101		209		133	
		84		115		238		152
Retrolental fibroplasia		—		—		3		142
Indefinite aetiology	12		18		48		35	
Not fully certified	23		26		2		—	
		35		44		50		35
		237		251		354		335

* Sorsby, A. 1945. For data 1920–43.

† Present survey (Table 21) for data 1944–54.

‡ 3 cases of optic atrophy secondary to tuberculous meningitis and 2 cases of endophthalmitis.

An authoritative estimate (General Register Office, 1954) of the population for 1973 gives (as can be seen from the last column of Table 31 (a)), a total population of 46,175,000, of whom some 6,745,000 are expected to be aged 65 years or over. A decline in the proportion of children is expected without substantially affecting the total number of children (since the population as a whole will increase somewhat); the population aged 15–64 will show an increase by about 1,000,000, whilst that aged 65 and over will increase by some 2,000,000. Assuming the present annual rates of blindness per 100,000 in the different age groups to persist, the additional number of blind during the active years of life will not be high, nor will the decrease in the number of blind children, but there will be a marked increase in the blind over 65. On the current rate of registration, the postulated increase in the general population over 65 years will give about 240,000 registrations between 1954 and 1973. On the assumption that some 20 per cent of the new registrations are reflected as an increase in the blind population (80 per cent being neutralised by death and removals—a proportion found to apply over the past ten years or so) the blind population in 1973 will rise to around 140,000. This does not take into account the increasing rate per 100,000 seen in the elderly in recent years, nor the fact that the most marked increase in numbers will occur in those over 75 who have a specially high rate (but also a high mortality).

A blind population of around 140,000 in 1973 may well prove to be an underestimate—possibly a serious underestimate. A more confident forecast would be feasible if only medical considerations were in play, but actually the high proportion of new registrations that in recent years has come through the National Assistance Board, makes any forecast liable to be considerably disturbed by any of the factors which affect the number of people seeking national assistance.

> On the one hand the numbers may continue to rise as they have done in recent years. In December, 1948 some 1,011,000 sought national assistance, and by December, 1954 the number had risen steadily to 1,796,000, of whom 1,308,000 were aged 60 years or more. If spouses of applicants are included, the number over 60 years comes to some 1,536,000—or 21·2 per cent of the total population aged 60 years or more. If the pensionable age is considered (60 for women and 65 for men) 20·1 per cent of men and 25·2 per cent of women eligible for old age pensions now seek national assistance (National Assistance Board, 1954). Any continuation of this trend is likely to increase the number of people referred by the National Assistance Board for blind registration. On the other hand the number of old age pensioners who seek national assistance may decline as the contributory schemes current today become effective at retiring age.

In children of school age the effect of changes in numbers and of rates of blindness has already become an immediate problem. With a stationary rate of blindness in a slightly rising school population there is no hope that the existing pressure on the accommodation at schools for the blind will prove transient. In fact the pressure will become drastically accentuated with the inflow into Schools for the Blind of children blinded by retrolental fibroplasia since 1948. It is, however, likely that this particular pressure may well have reached its peak by 1960 and decline steeply by 1970.

Causes

The assumption of an increasing number of blind postulates no change in the causes of blindness. The decline of infectious disease as a cause of blindness has almost come to an end and, unless purposive and effective action is taken, there is, in fact no reason to anticipate any considerable change in the major blinding affections. Cataract is the one substantial cause that should show a significant reduction from the exploitation of available measures.

Some tasks

Since nothing short of a massive—and unexpected—therapeutic advance can prevent a substantial and progressive increase in the number of blind in the foreseeable future, palliative measures—both administrative and clinical—assume a compelling interest, and fundamental researches become an inescapable necessity. Some possibilities require stressing:—

Administrative measures

Cataract. Since the previous study—in which it was stressed that some 80 per cent of those registered as blind from cataract had had no treatment—more beds have been made available for patients requiring cataract operation, whilst more expert opinion in certification as blind is ensuring that such blindness is likely to be treated. These measures should help, but the complexity of the problem is shown by the fact that as much as 36 per cent of the newly registered as blind are over the age of 80. In fact, amongst those registered as blind from cataract there are almost as many octogenarians and nonagenarians as in all the age groups below 80. Geriatric care is therefore likely to be needed in a high proportion, if surgical treatment is to become feasible on a substantial scale. The co-ordination recently effected between the South Western Hospital with its geriatric patients, Lambeth Hospital with its beds and general services and the Royal Eye Hospital with its ophthalmic facilities, may well prove a significant development. It is likely that a fuller exploitation of the facilities of the general medical services, and possibly of the supplementary ophthalmic services will become essential. That so many of the blind over the age of 70 are referred for certification by the National Assistance Board implies that under existing conditions there is an inadequate relationship between the elderly and their general practitioners and the ophthalmic centres. At registration many of those blind from cataract are old and frail, but could in all probability have undergone a cataract operation comfortably and safely some years earlier. The National Health Service with its proud aim of providing health services and not merely treatment in sickness, appears to have an excellent field of action with the aging population. For one thing the supervision of the occular health of the aged is not an unworthy task for the general practitioner, working in harmony with the ophthalmic centres. To create such harmonious contacts between the three parties should not prove an administrative impossibility.

Glaucoma. The setting up of glaucoma clinics, whilst unlikely to give immediate results on a large scale, should do much for individual patients. The greatest value of such clinics will probably lie in the concentration of material and in so compelling a clearer appreciation of the issues involved. As yet, few such clinics are available—and the toll of blindness from glaucoma is now some 1,600 annually with many thousands suffering gross visual damage.

Injuries. Industrial injuries present a simpler problem than non-industrial injuries, if only because the conditions under which they occur are much more uniform and so more readily amenable to analysis and control. Detailed data are, however, lacking and these will have to be obtained before any effective measures can be instituted. Two possibilities present themselves for the collection of the necessary data. A special follow-up enquiry on those registered blind from trauma in recent years might make it possible to define retrospectively the conditions under which the blinding accidents had occurred. Alternatively a steady stream of information might be made available by adequate notification of all accidents—non-industrial as well as industrial—leading to serious ocular injury—and this would cover not only the some 430 individuals registered each year as blinded (exclusively or in part) by injury, but also many hundreds in the general population who lose the sight of one eye through this cause. Some administrative action on blindness from injury seems imperative, and it is well worth meeting the difficulties inherent in such action, for there is much promise in the preventive measures that would become feasible.

Clinical developments

A number of affections, whilst not figuring with any high incidence in the blind statistics as a whole, have a considerable significance in some age groups. Iritis and iridocyclitis, diabetic lesions, the hypertensive cardiovascular disturbances, and the neurological affections (which in this context stand for diseases of the central nervous system, optic atrophy from intracranial tumours, and optic atrophy of unknown origin) are all significant in themselves and together are responsible for a substantial proportion of the blind. These disorders are all the more significant because generally they produce blindness during the active years of life—together they are responsible for about 25–30 per cent of cases in each of the different age groups between 20 and 60—and apart from blindness, they produce much visual disability. The problems they all present are aspects of general medicine as much as of ophthalmology.

If the congenital and hereditary affections are included amongst the general medical disorders, some 80 per cent or more of the blind under 50 present fairly well defined problems in general medicine. Hope in these affections lies not in an expansion of the surgical facilities available, but in the creation of clinical units which can draw on the potentialities of both ophthalmology and general medicine, even if this involves some departure from the traditions of ophthalmology as an essentially surgical speciality. The need for such medical-ophthalmological units has been emphasized by recent developments in the treatment of the cardiovascular diseases and possibly also of their ocular complications, whilst intensive clinical studies on diabetes, the inflammatory diseases, and the neurological affections, are themselves not without promise. Units of this type would for the present be mainly clinical research units, but they would not lack therapeutic interest.

Clinical research units would have no dearth of problems to study, for apart from those of medical-ophthalmological interest, there are many more purely ophthalmic in character. Recent developments in optics, which allow the use of lenses in gross visual disabilities are amongst the issues that await systematic clinical research facilities. Furthermore the field for clinical research becomes immense if the urgently needed studies on the clinical genetics of the blinding affections are undertaken on an adequate scale.

Fundamental research

Beyond the immediate clinical issues lies the need for an understanding of the major blinding diseases of today. In none is there any prospect of early solution of the complex problems involved. It is gratifying that in recent years considerable facilities for fundamental ophthalmological research have become available, but in view of the size and scope of the problems at issue, it would be unrealistic to regard these developments as anything but an auspicious beginning.

REFERENCES

BOARD OF EDUCATION (1922). In Departmental Committee on the Causes and Prevention of Blindness. Final Report. Ministry of Health, London: H.M. Stationery Office.

GENERAL REGISTER OFFICE (1954). The Registrar General's Quarterly Returns for England and Wales. Quarter ending 31st December, 1953. (No. 420). Table 3. London: H.M. Stationery Office.

MINISTRY OF HEALTH. Annual Reports. Part II. On the state of the Public Health. 1952, p. 226; 1953, p. 220; 1954, p. 173. London: H.M. Stationery Office.

NATIONAL ASSISTANCE BOARD. Report for the year 1954. London: H.M. Stationery Office.

SORSBY, A. (1945), Ophthalmia Neonatorum. London: Hamish Hamilton.

——— (1950), The Causes of Blindness in England and Wales. Medical Research Council. Memo. 24. London: H.M. Stationery Office.

——— (1953), The Causes of Blindness in England, 1948–1950. A report to the Ministry of Health. London: H.M. Stationery Office.

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TABLE A

Causes of blindness in patients blinded by the same cause in both eyes: numbers recorded

Cause of Blindness	*1951*		*1952*		*1953*		*1954*		*1951–54*		
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*P*
A1 *Congenital anomalies:*											
Globe as a whole *without* record of family history	82	75	72	64	46	33	50	44	250	216	466
Globe as a whole with positive family history	5	6	2	4	5	5	2	3	14	18	32
Cataract *without* record of family history	45	32	41	43	28	39	49	40	163	154	317
Cataract with positive family history ...	3	9	1	1	6	4	3	3	13	17	30
Optic atrophy *without* record of family history	16	13	14	9	22	11	19	15	71	48	119
Optic atrophy with positive family history	—	—	—	—	1	1	3	1	4	2	6
Others, *without* record of family history...	38	43	39	43	44	30	30	42	151	158	309
Others, with positive family history ...	4	—	3	4	2	3	1	3	10	10	20
	193	178	172	168	154	126	157	151	676	623	1,299
Abiotrophic defects:											
Retinitis pigmentosa and allied conditions:											
Without record of family history ...	60	52	54	45	52	44	50	49	216	190	406
With positive family history	38	41	53	42	41	40	25	35	157	158	315
Optic atrophy *without* record of family history	3	—	2	1	1	—	—	3	6	4	10
Optic atrophy with positive family history	2	2	4	3	9	4	11	1	26	10	36
Others, *without* record of family history...	—	5	4	1	3	3	2	3	9	12	21
Others, with positive family history ...	4	5	3	5	—	3	2	1	9	14	23
	107	105	120	97	106	94	90	92	423	388	811
A2 *Myopia:*											
Choroidal atrophy	190	403	209	430	163	378	177	445	739	1,656	2,395 (2)
Retinal detachment...	30	23	18	25	22	19	27	30	97	97	194
Other...	1	5	4	2	5	8	1	5	11	20	31
	221	431	231	457	190	405	205	480	847	1,773	2,620 (2)
A4 *Glaucoma, primary*	434	635	452	621	448	573	422	607	1,756	2,436	4,192 (3)
A5 *Cataract, primary senile*	658	1,395	640	1,377	618	1,304	633	1,433	2,549	5,509	8,058 (5)
A6 *Other primary defects:*											
Retinal detachment...	32	31	30	22	22	24	17	29	101	106	207 (1)
Eales' disease	7	4	7	2	9	1	3	—	26	7	33
Other...	—	1	1	—	—	1	1	2	2	4	6
	39	36	38	24	31	26	21	31	129	117	246 (1)
A7 *Tumour (intraocular):*											
Glioma	3	2	4	—	2	1	5	5	14	8	22
Other...	—	1	—	—	—	—	—	—	—	1	1
	3	3	4	—	2	1	5	5	14	9	23
A8 *Tumour (adnexa)*	1	—	3	2	—	—	2	—	6	2	8
Total congenital and undetermined causes	1,656	2,783	1,660	2,746	1,549	2,529	1,535	2,799	6,400	10,857	17,257 (11)

TABLE A—*contd.*

Causes of blindness in patients blinded by the same cause in both eyes: numbers recorded

Cause of Blindness	*1951*		*1952*		*1953*		*1954*		*1951–54*		
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*P*
B1 Ophthalmia neonatorum	11	14	8	15	5	11	6	11	30	51	81
B2 Gonorrhoea	—	—	—	—	—	—	—	—	—	—	—
B3 Syphilis:											
(*a*) Congenital:											
Interstitial keratitis	12	36	19	35	8	40	8	29	47	140	187
Disseminate choroiditis	3	4	1	—	1	2	2	6	7	12	19
Optic atrophy	1	2	—	—	3	2	—	—	4	4	8
Globe as a whole	4	3	3	1	1	2	2	—	10	6	16
	20	45	23	36	13	46	12	35	68	162	230
(*b*) Acquired:											
Optic atrophy	9	4	19	3	9	4	13	4	50	15	65
Choroiditis	1	2	—	—	1	1	4	4	6	7	13
Other	—	—	—	—	1	1	—	—	1	1	2
	10	6	19	3	11	6	17	8	57	23	80
B4 Trachoma	—	7	2	11	2	10	—	7	4	35	39
B6 Specific fevers	4	8	3	6	1	6	3	5	11	25	36
B7 Meningitis	2	2	7	3	4	2	2	1	15	8	23
B8 Tuberculosis:											
Iritis	—	3	1	2	—	1	—	—	1	6	7
Other...	4	8	3	—	7	6	7	8	21	22	43
	4	11	4	2	7	7	7	8	22	28	50
B9 Phlyctenular ophthalmia	2	11	2	5	5	6	1	6	10	28	38
Total infectious and bacterial causes ...	53	104	68	81	48	94	48	81	217	360	577
C1 Industrial trauma	14	1	14	—	15	2	4	—	47	3	50
C2 Industrial disease	—	—	1	—	—	—	—	—	1	—	1
C3 Non-industrial trauma	10	7	11	5	8	2	8	7	37	21	58
C4 Non-industrial disease	2	—	5	—	6	2	10	1	23	3	26
C5 Birth trauma	1	—	—	—	—	—	1	—	2	—	2
C6 War trauma	15	—	17	3	13	1	19	1	64	5	69
C7 Trauma, not specified	—	—	—	—	—	—	—	—	—	—	—
Total traumatic causes	42	8	48	8	42	7	42	9	174	32	206

Cause of Blindness	*1951*		*1952*		*1953*		*1954*		*1951–54*		
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*P*
D1 *Anaemia and other blood diseases:*											
Optic atrophy	2	1	5	1	2	1	2	3	11	6	17
Other...	—	1	—	—	—	1	—	—	—	2	2
	2	2	5	1	2	2	2	3	11	8	19
D2 *Vascular disease, including cerebral vascular lesions:*											
Retinal lesions	72	111	92	94	84	122	93	116	341	443	784 (1)
Optic atrophy	8	6	8	13	16	16	16	23	48	58	106
Other...	14	10	18	6	16	18	20	16	68	50	118 (1)
	94	127	118	113	116	156	129	155	457	551	1,008 (2)
D3 *Diseases of the central nervous system excluding B3, B7, D4 and D5:*											
Optic atrophy	17	16	25	15	14	11	22	17	78	59	137
Other...	3	4	2	4	5	1	2	—	12	9	21
	20	20	27	19	19	12	24	17	90	68	158
D4 *Diseases of pregnancy*...	—	2	—	—	—	2	—	2	—	6	6
D5 *Intracranial neoplasm:*											
Optic atrophy	43	31	23	22	28	31	26	29	120	113	233
Other...	—	—	—	—	1	1	—	—	1	1	2
	43	31	23	22	29	32	26	29	121	114	235
D6 *Diabetes:*											
Retinopathy...	64	257	97	329	102	328	105	426	368	1,340	1,708
Globe as a whole	13	30	4	17	5	21	6	35	28	103	131
Other...	—	3	—	1	1	7	2	8	3	19	22
	77	290	101	347	108	356	113	469	399	1,462	1,861
D7 *Nephritis*	4	3	2	6	2	2	1	2	9	13	22
D8 *Other general diseases*...	8	18	11	22	11	14	13	12	43	66	109 (1)
D9 *Senile macular lesions*...	568	841	665	1,003	660	982	728	1,209	2,621	4,035	6,656 (5)
Total general diseases	816	1,334	952	1,533	947	1,558	1,036	1,898	3,751	6,323	10,074 (8)
E. *Aetiology undetermined, anatomical diagnosis:*											
Optic atrophy	94	62	78	70	82	64	81	70	335	266	601 (1)
Iritis and iridocyclitis	68	132	69	136	74	115	53	138	264	521	785
Corneal lesions	37	90	51	72	35	82	43	83	166	327	493
Choroidal lesions	25	32	15	21	21	24	19	20	80	97	177
Retinal lesions	7	14	17	6	13	15	8	10	45	45	90
Cataract	—	—	—	—	1	1	—	—	1	1	2
Vitreous lesions	—	—	—	—	—	1	—	1	—	2	2
Globe as a whole	46	81	47	63	63	72	55	84	211	300	511
Total aetiology unknown	277	411	277	368	289	374	259	406	1,102	1,559	2,661 (1)
GRAND TOTAL—all causes...	2,844	4,640	3,005	4,736	2,875	4,562	2,920	5,193	11,644	19,131	30,775 (20)

The totals under Persons occasionally carry a figure in brackets, which represents an additional number of individuals of sex not recorded.

TABLE A.1

Causes of blindness in patients blinded by the same cause in both eyes: percentage distribution

	1951			*1952*			*1953*			*1954*			*1951–54*		
	M	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*
A1 Congenital anomalies ...	6·8	3·8	5·0	5·7	3·5	4·4	5·3	2·8	3·8	5·4	2·9	3·8	5·8	3·3	4·2
Abiotrophic defects: ...	3·7	2·2	2·8	4·0	2·1	2·8	3·7	2·1	2·7	3·1	1·8	2·2	3·6	2·0	2·6
A2 Myopia	7·8	9·3	8·7	7·7	9·6	8·9	6·6	8·9	8·1	7·0	9·3	8·5	7·3	9·3	8·5
A4 Glaucoma, primary ...	15·3	13·7	14·3	15·1	13·1	13·9	15·6	12·6	13·7	14·5	11·7	12·7	15·1	12·7	13·6
A5 Cataract, primary senile	23·1	30·1	27·4	21·3	29·1	26·0	21·5	28·6	25·9	21·7	27·6	25·4	21·9	28·8	26·2
A6 Other primary defects ...	1·4	0·8	1·0	1·2	0·5	0·8	1·1	0·5	0·7	0·7	0·6	0·6	1·1	0·6	0·8
A7 Tumour, intraocular ...	0·1	0·1	0·1	0·1	—	0·1	0·1	0·0	0·0	0·2	0·1	0·1	0·1	0·0	0·1
A8 Tumour, adnexa	0·0	—	0·0	0·1	0·0	0·1	—	—	—	0·1	—	0·0	0·0	0·0	0·0
B1 Ophthalmia neonatorum	0·4	0·3	0·3	0·3	0·3	0·3	0·2	0·2	0·2	0·2	0·2	0·2	0·3	0·3	0·3
B2 Gonorrhoea	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
B3 Syphilis:															
(*a*) Congenital ...	0·7	1·0	0·8	0·8	0·8	0·7	0·5	1·1	0·8	0·4	0·7	0·6	0·6	0·8	0·7
(*b*) Acquired	0·4	0·1	0·2	0·6	0·1	0·3	0·4	0·1	0·2	0·6	0·2	0·3	0·5	0·1	0·3
B4 Trachoma	—	0·2	0·1	0·1	0·2	0·2	0·1	0·2	0·2	—	0·1	0·1	0·0	0·2	0·1
B6 Specific fevers	0·1	0·2	0·2	0·1	0·1	0·1	0·0	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·1
B7 Meningitis	0·1	0·0	0·1	0·2	0·1	0·1	0·1	0·0	0·1	0·1	0·0	0·0	0·1	0·0	0·1
B8 Tuberculosis	0·1	0·2	0·2	0·1	0·0	0·1	0·2	0·2	0·2	0·2	0·2	0·2	0·2	0·2	0·2
B9 Phlyctenular ophthalmia	0·1	0·2	0·2	0·1	0·1	0·1	0·2	0·1	0·1	0·0	0·1	0·1	0·1	0·2	0·1
C1 Industrial trauma ...	0·5	—	0·2	0·5	—	0·2	0·5	0·0	0·2	0·1	—	0·1	0·4	0·0	0·2
C2 Industrial disease ...	—	—	—	0·0	—	0·0	—	—	—	—	—	—	0·0	—	0·0
C3 Non-industrial trauma ...	0·4	0·2	0·3	0·4	0·1	0·2	0·3	0·1	0·1	0·3	0·1	0·2	0·3	0·1	0·2
C4 Non-industrial disease ...	0·1	—	0·0	0·2	—	0·1	0·2	0·1	0·1	0·3	0·0	0·1	0·2	0·0	0·1
C5 Birth trauma	0·0	—	0·0	—	—	—	—	—	—	0·0	—	0·0	0·0	—	0·0
C6 War trauma	0·5	—	0·2	0·5	0·1	0·2	0·5	0·0	0·2	0·7	0·0	0·2	0·6	0·0	0·2
C7 Trauma, not specified ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

	1951			1952			1953			1954			1951–54		
	M	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*	*M*	*F*	*P*
D1 Anaemia and other blood diseases	0·1	0·0	0·0	0·2	0·0	0·1	0·1	0·0	0·1	0·1	0·1	0·1	0·1	0·0	0·1
D2 Vascular disease, including cerebral vascular lesions	3·3	2·7	3·0	3·9	2·4	3·0	4·0	3·4	3·7	4·4	3·0	3·5	3·9	2·9	3·3
D3 Diseases of the central nervous system, excluding B3, B7, D4 and D5	0·7	0·4	0·5	0·9	0·4	0·6	0·7	0·3	0·4	0·8	0·3	0·5	0·8	0·4	0·5
D4 Diseases connected with pregnancy and childbirth	—	0·0	0·0	—	—	—	—	0·0	0·0	—	0·0	0·0	—	0·0	0·0
D5 Intracranial neoplasm ...	1·5	0·7	1·0	0·8	0·5	0·6	1·0	0·7	0·8	0·9	0·6	0·7	1·0	0·6	0·8
D6 Diabetes	2·7	6·3	4·9	3·4	7·3	5·8	3·7	7·8	6·2	3·9	9·0	7·2	3·4	7·6	6·0
D7 Nephritis	0·1	0·1	0·1	0·1	0·1	0·1	0·1	0·0	0·1	0·0	0·0	0·0	0·1	0·1	0·1
D8 Other general diseases ...	0·3	0·4	0·4	0·4	0·5	0·4	0·4	0·3	0·3	0·4	0·2	0·3	0·4	0·4	0·3
D9 Senile macular lesions ...	20·0	18·1	18·8	22·0	21·2	21·5	22·9	21·6	22·1	24·9	23·3	23·9	22·5	21·1	21·6
E *Aetiology undetermined:*															
Optic atrophy ...	3·3	1·3	2·1	2·5	1·5	1·9	2·8	1·4	2·0	2·8	1·3	1·9	2·9	1·4	2·0
Iritis and iridocyclitis	2·4	2·9	2·7	2·3	2·9	2·6	2·6	2·6	2·5	1·8	2·7	2·4	2·3	2·7	2·5
Corneal lesions ...	1·3	1·9	1·7	1·7	1·5	1·6	1·2	1·8	1·6	1·5	1·6	1·6	1·4	1·7	1·6
Choroidal lesions ...	0·8	0·7	0·7	0·5	0·4	0·5	0·7	0·5	0·6	0·7	0·4	0·5	0·7	0·5	0·6
Retinal lesions ...	0·3	0·3	0·3	0·6	0·1	0·3	0·5	0·3	0·4	0·3	0·2	0·2	0·4	0·3	0·3
Cataract	—	—	—	—	—	—	0·0	0·0	0·0	—	—	—	0·0	0·0	0·0
Vitreous lesions ...	—	—	—	—	—	—	—	0·0	0·0	—	0·0	0·0	—	0·0	0·0
Globe as a whole ...	1·6	1·8	1·7	1·6	1·4	1·4	2·2	1·6	1·8	1·8	1·6	1·7	1·8	1·6	1·7
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

TABLE B

Causes of blindness in patients blinded by a different cause in each eye

Numbers recorded for 1951, 1952, 1953, 1954, *and numbers and percentage distribution,* 1951–54

Each eye listed separately

	1951		*1952*		*1953*		*1954*		*1951–54*					
									M		*F*		*P*	
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*No.*	*Per cent.*	*No.*	*Per cent.*	*No.*	*Per cent.*
A1 *Congenital anomalies*	4	4	5	4	3	6	6	8	18	0·7	22	0·9	40	0·8
Abiotrophic defects	—	—	—	—	—	—	—	1	—	—	1	0·1	1	0·0
A2 *Myopia:*														
Choroidal atrophy	16	19	11	21	24	32	22	36	73		108		181 (3)	
Retinal detachment	4	4	1	—	7	5	1	—	13		9		22	
Other	—	—	—	1	2	5	1	1	3		7		10	
	20	23	12	22	33	42	24	37	89	3·5	124	4·7	213 (3)	4·2
A4 *Glaucoma, primary*	72	83	59	74	77	96	77	84	285	11·3	337	12·8	622 (1)	12·1
A5 *Cataract, primary, senile*	138	181	134	133	114	193	137	196	523	20·8	703	26·6	1,226 (1)	23·8
A6 *Other primary defects:*														
Retinal detachment	28	14	17	27	18	24	21	25	84		90		174	
Other	—	1	—	—	2	1	1	—	3		2		5	
	28	15	17	27	20	25	22	25	87	3·5	92	3·5	179	3·5
A7 *Tumour, intraocular*	2	2	3	1	2	2	1	6	8	0·3	11	0·4	19	0·4
A8 *Tumour, adnexa*	2	1	2	2	1	1	6	3	11	0·4	7	0·3	18	0·3
A9 *Amblyopia ex anopsia*	25	24	24	27	20	30	27	31	96	3·8	112	4·3	208	4·0
B1 *Ophthalmia neontorum*	—	1	2	—	1	2	1	2	4	0·2	5	0·2	9	0·2
B2 *Gonorrhoea*	—	—	—	—	—	1	—	—	—		1	0·0	1	0·0
B3 *Syphilis:*														
(*a*) Congenital	—	—	—	1	—	1	1	—	1		2		3	
(*b*) Acquired	1	—	—	—	—	—	—	—	1		—		1	
	1	—	—	1	—	1	1	—	2	0·1	2	0·1	4	0·1
B4 *Trachoma*	1	—	1	—	—	—	—	1	2	0·1	1	0·0	3	0·1
B6 *Specific fevers*	4	6	2	3	1	3	—	5	7	0·3	17	0·7	24 (1)	0·5
B8 *Tuberculosis*	—	—	—	—	—	—	1	—	1	0·0	—		1	0·0
B9 *Phlyctenular ophthalmia*	2	4	—	—	1	—	1	2	4	0·2	6	0·2	10	0·2

C1	*Industrial trauma:*														
	Optic atrophy	—	—	—	—	2	—	1	—	3		—		3	
	Detachment	—	—	—	—	1	—	1	1	2		1		3	
	Choroidal lesions	—	—	—	—	1	—	—	—	1		—		1	
	Corneal lesions	2	—	1	—	1	—	4	—	8		—		8	
	Globe as a whole	67	6	56	11	46	3	57	7	226		27		253	
		69	6	57	11	51	3	63	8	240	9·5	28	1·1	268	5·2
C2	*Industrial disease*	—	—	—	—	—	—	—	1	—	—	1	0·0	1	0·0
C3	*Non-industrial trauma:*														
	Optic atrophy	2	—	1	—	1	—	1	—	5		—		5	
	Detachment	1	—	—	—	2	1	2	1	5		2		7	
	Cataract	—	—	—	1	3	1	—	—	3		2		5	
	Globe as a whole	77	63	64	51	65	57	70	71	276		242		518	
	Other	—	—	—	—	—	1	1	2	1		3		4	
		80	63	65	52	71	60	74	74	290	11·5	249	9·4	539	10·4
C4	*Non-industrial disease*	3	—	—	—	1	1	—	—	4	0·2	1	0·0	5	0·1
C6	*War trauma*	15	3	11	—	14	2	14	3	54	2·2	8	0·3	62	1·2
C7	*Trauma unspecified*	2	—	11	9	7	4	5	3	25	1·0	16	0·6	41	0·8
C8	*Sympathetic ophthalmia*	17	11	15	8	13	22	6	21	51	2·0	62	2·4	113 (1)	2·2
D1	*Anemia and other blood diseases* ...	—	—	—	—	—	1	1	—	1	0·0	1	0·1	2	0·0
D2	*Vascular diseases, including cerebral vascular lesions*	30	36	35	33	53	67	66	60	184	7·3	196	7·4	380	7·4
D3	*Diseases of the central nervous system excluding B3, B7, D4 and D5* ...	2	3	3	5	1	3	1	2	7	0·3	13	0·5	20	0·4
D4	*Diseases connected with pregnancy and childbirth*	—	—	—	—	—	1	—	—	—	—	1	0·1	1	0·0
D5	*Intracranial neoplasm*	—	—	—	—	1	—	—	—	1	0·0	—	—	1	0·0
D6	*Diabetes*	3	4	1	5	4	6	1	8	9	0·4	23	0·9	32 (1)	0·6
D8	*Other general diseases*	2	—	—	1	1	1	3	3	6	0·2	5	0·2	11	0·2
D9	*Senile macular lesions*	44	43	46	51	64	35	53	64	207	8·2	193	7·3	400	7·7
E1	*Aetiology undetermined:*														
	Optic atrophy	9	7	13	9	6	9	9	15	37	1·5	40	1·5	77	1·5
	Iritis and iridocyclitis	4	18	4	10	8	10	12	23	28	1·1	61	2·3	89	1·7
	Choroiditis	1	—	1	1	4	4	2	4	8	0·3	9	0·4	17	0·3
	Corneal lesions	23	13	10	25	21	27	23	23	77	3·1	88	3·3	165 (1)	3·2
	Retinal lesions	1	—	1	—	—	2	2	2	4	0·2	4	0·2	8	0·2
	Cataract	—	—	—	—	—	1	—	—	—	—	1	0·1	1	0·0
	Globe as a whole	28	53	30	30	49	47	41	69	148	5·8	199	7·5	347 (1)	6·7
		66	91	59	75	88	100	89	136	302		402		704 (2)	
	Total	632	604	564	544	642	708	680	784	2,518	100·0	2,640	100·0	5,158 (10)	100·0

The totals under Persons occasionally carry a figure in brackets, which represents an additional number of individuals of sex not recorded.

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